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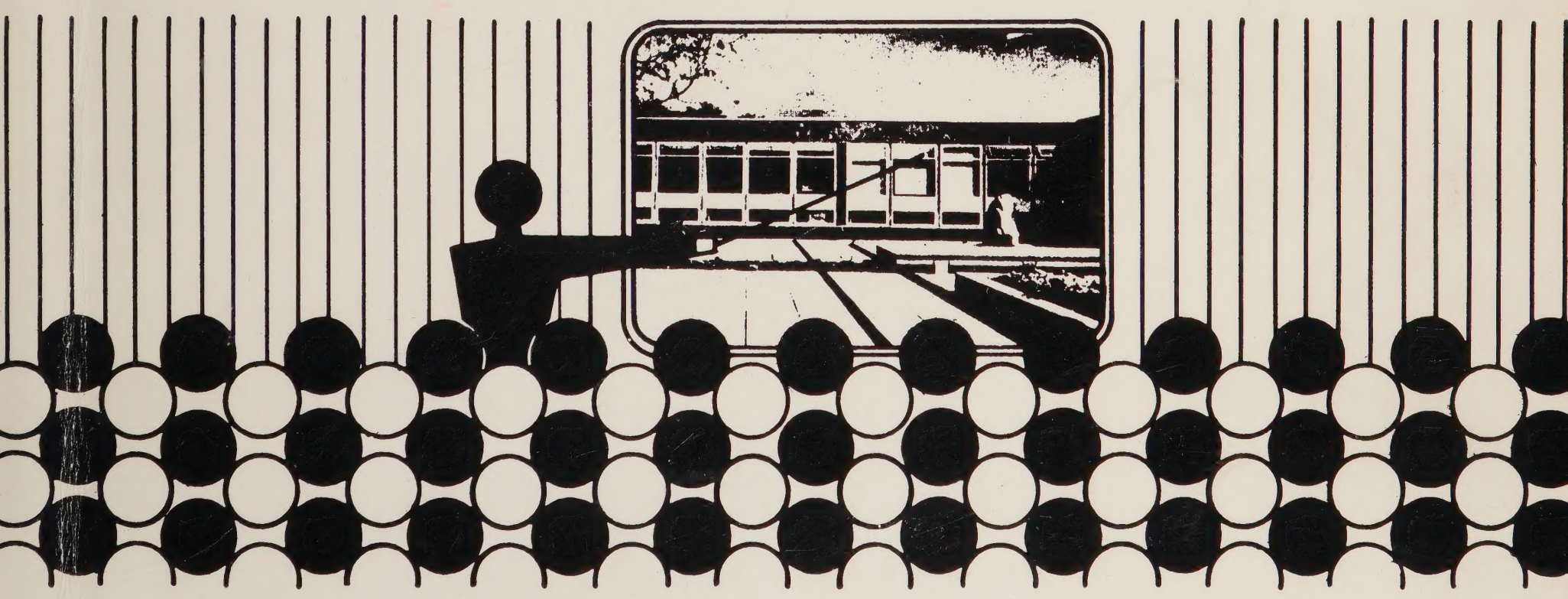

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CHAIRMEN

Mr A R Batchelor (twice)

Sir John Brotherston (twice)

Mr R P Fraser

Dr R C Graham (twice)

Dame Muriel Powell

Dr J Sturrock

MAIN SPEAKERS

Information services - April 1972

Mr K E Bodenham, Managing Consultant, Scientific Control Systems
Dr M A Heasman, Director, Research and Intelligence Unit, Scottish Home and Health Department
Dr R C Graham, Senior Administrative Medical Officer, Eastern Regional Hospital Board
Professor W W Holland, Department of Clinical Epidemiology and Social Medicine, St Thomas's Hospital Medical School, London
Mr W P Lawrie, Assistant Secretary, Scottish Home and Health Department
Professor R D Weir, Department of Social Medicine, University of Aberdeen

Computers in general practice - May 1972

Dr K T Gruer, Senior Medical Officer, Scottish Home and Health Department
Dr A J Haines, General Practitioner, Craigshill Health Centre, Livingston
Dr K A Harden, General Practitioner, Woodside Health Centre, Glasgow
Dr J S Bryden, Group Medical Superintendent, Paisley and District Hospitals

Home dialysis - September 1972

Dr G D Forwell, Principal Medical Officer, Scottish Home and Health Department
Mrs B Gettings, Nursing Officer, Scottish Home and Health Department
Dr J F Moorhead, Director, Department of Nephrology, Royal Free Hospital, London
Miss L Pavitt, Sister, Royal Free Hospital, London
Miss M E Selsby, Home Dialysis Administrator, Royal Free Hospital
Dr A T Lambie, Consultant Physician, Royal Infirmary of Edinburgh

Computers in preventive medicine - October 1972

Dr I D G Richards, Director, Social Paediatric and Obstetric Research Unit, Glasgow
Dr A Wood, Drug Monitoring Unit, Maryfield Hospital, Dundee
Mr J G Davies, Principal Scientific Officer, Scottish Home and Health Department

PREFACE

As in previous years the reports of major conferences held at the Scottish Hospital Centre have been brought together in one volume. At these nine sessions over 50 speakers have made contributions on a variety of subjects of current importance to the Hospital Service and increasingly to other branches of the Health Service in Scotland.

It is hoped that this resulting booklet will provide a source of useful reference material to those interested in the topics under review.

J. R. Y. MUTCH
Secretary

April 1973

Hospital Commissioning - October 1972

I Building and Technical Services

Mr R R C De'Ath, Architect, Keppie, Henderson and Partners, Glasgow
Mr T L McArthur, Quantity Surveyor, A L Currie and Brown, Glasgow
Mr I C Kirkwood, Consulting Engineer, Hulley and Kirkwood, Glasgow
Mr I G Hanna, Consulting Engineer, Donald, Smith, Seymour and Rooley, Glasgow
Mr J Timoney, Chief Clerk of Works/Site Co-ordinator, Western Regional Hospital Board
Mr T A Maxwell, John Laing Construction Limited

II Equipping and Staffing

Dr D M McLellan, Medical Officer, Scottish Hospital Centre
Mr W A Brown, Principal Assistant Secretary, Western Regional Hospital Board
Mr C W King, Project Leader, Commissioning Team, Aberdeen Royal Infirmary
Mr H Hogg, Principal Assistant Secretary (Supplies), Western Regional Hospital Board
Miss A H Court Brown, Chief Regional Nursing Officer, Western Regional Hospital Board
Mrs M G Saunders, Adviser on Domestic and Ancillary Services, Scottish Home and Health Department
Mr W P Lawrie, Assistant Secretary, Scottish Home and Health Department

The nurse and research - October 1972

Professor Margaret Scott Wright, Department of Nursing Studies, University of Edinburgh
Miss L Hockey, Nursing Research Unit, University of Edinburgh
Miss M Clark, Senior Nursing Officer, Glasgow Royal Infirmary
Mrs A Tierney, Research Fellow, Department of Nursing Studies, University of Edinburgh
Miss E A Reid, Nursing Officer, Scottish Home and Health Department
Miss J Wilson-Barnett, Sister, St George's Hospital, London
Miss K Williams, Research Fellow, Department of Sociology, University of Aberdeen

Comprehensive health planning - November 1972

Mr K Barnard, Research Officer, Health Services Planning, The Hospital Centre, London
Mr J Stringer, Director, Institute for Operational Research, London
Dr D G Gooding, Principal Medical Officer, Buckinghamshire County Council
Dr A H Duncan, Principal Medical Adviser, Health Services Joint Advisory Committee, Livingston
Dr T F M Jackson, Medical Officer of Health, East Kilbride
Dr I M Macgregor, Principal Medical Officer, Scottish Home and Health Department
Mr W P Lawrie, Assistant Secretary, Scottish Home and Health Department

Neo-natal information services - February 1973

Dr I W Kemp, Medical Officer, Scottish Home and Health Department
Dr J D Donnelly, Medical Officer, Scottish Home and Health Departmen
Dr G M McIlwaine, Research Fellow, Glasgow Royal Maternity Hospital
Dr C H M Walker, Consultant Paediatrician, Dundee
Dr F Cockburn, Consultant Paediatrician, Edinburgh
Mr J H Scott, Computer Manager, Eastern Regional Hospital Board

Information services

Meeting at the Scottish Hospital Centre on Thursday 27 April 1972

At this conference the likely developments in the provision of information services for a unified Health Service were appraised and existing arrangements for data collection reviewed in the light of the recent report "Foundations for health service management" published for SHHD.

MR R P FRASER took the Chair

MR K E BODENHAM, Managing Consultant, Scientific Control Systems Limited, spoke as co-author of the Report "Foundations for health service management"* prepared for the Scottish Home and Health Department on the requirements for a health service information system. During the preliminary stages of the study which began in autumn 1970, two immediate difficulties were faced: the best informed individuals were heavily engaged in day to day work which visits necessarily interrupted, and what was being considered was a future organisation in which none of the existing statutory NHS bodies existed. Discussions nevertheless proved most helpful; patterns slowly began to emerge; and it became clear that careful consideration was required of the organisation and siting of data banks, that there were several major groups of data and a number of more or less controversial issues would have to be considered.

To assist with formulating ideas on the siting of data banks the functions of Health Boards and Central Bodies were examined critically. Health Boards were to provide services to the people of their area and would need to get involved in the assessment of staffing requirements for the general medical, pharmaceutical, dental and ophthalmic services: assessment of work loads at hospitals hence requirements for staff premises, clinic sessions and equipment: assessment of requirements for various programmes such as vaccination and immunisation and screening: monitoring the effectiveness of previous recommendations: and data release to professional staff to assist them in monitoring their own performance. To do this effectively the Health Board would need data on population - the people of the area, identified and classified, with the capability to monitor morbidity patterns and resource data on staff supplies, building etc. The main distinction between Health Boards and the Central Bodies was the long-term strategic nature of the work of the latter together with activities such as manpower planning, remuneration, prescription pricing and various kinds of research. The need therefore was for data on major morbidity episodes, manpower, supplies and drugs. Much of this information would be obtainable from Health Boards while the remainder could be made available as a by-product of existing or new Health Service procedures.

Of the many varied data requirements five main groups were discernible:-

(i) People and patients:

These were the users and the potential users of the Service. People required to be identified and classified and the Health

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* Bodenham, K E and Wellman, F. Foundations for health service management. London, O.U.P. for N.P.H.T., 1972.

Board must know their whereabouts and be able to analyse their requirements, ie it would need a master patient register;

(ii) Personnel:

The NHS in Scotland employed 80,000 people and staff costs accounted for 60% of the expenditure. Some kinds of staff were already scarce, others were certain to become scarcer and available statistics underlined the increasing competition which the NHS faced for some categories of staff. It was therefore essential to make the best use of existing staff and to plan future recruitment and training thoroughly;

(iii) Supplies, drugs and buildings:

These were the other three major data areas identified and each of them absorbed 10% or more of NHS expenditure.

Seven chapters of the report were concerned with specific issues which would have to be faced and of these the most important were the organisation of the information services themselves and the continuing urgency of the situation. Although the appointed day for the inception of the re-organised service was 1 April 1974 neither the Health Service nor re-organisation of the Health Service, nor the development of information services started or stopped at any one time. All were continuing processes reaching far into the future but equally many steps had already been taken and many more could be taken before that date.

Mr Bodenham concluded by noting that the study was intended to be a preliminary survey to give a broad picture of requirements and it did not attempt to solve all the problems. The urgency of the situation however was very apparent to establish a system which was designed to put the data where it belonged and could best be used.

DR M A HEASMAN, Director, Research and Intelligence Unit, Scottish Home and Health Department, noted that the Department's Discussion Paper* concentrated almost entirely on the organisational aspects of the Service and that the ideas contained in the Scicon Report would require very detailed study as to their feasibility, the benefits to be expected and the likely cost levels involved. Efficient management of the Health Service required considerably more information than was available ready for use at present, and this would be particularly the case for Health Boards under the new structure, when re-organisation would allow authorities to take an overall view of the problems in their areas in a way that had not hitherto been possible. In order that they could do this it was only right that they themselves became the main repositories of the data which they would wish to use.

Hospitals and Health Centres would have to provide information rapidly and accurately to Health Boards and each Board would in turn have to establish efficient local information services to process and interpret the data. It was essential to avoid the duplicate collection and analysis of information which with co-operation could be collected for different purposes at much less cost and effort.

It seemed essential that the information services of the future had to be established on an all-Scotland basis. As stated in the Discussion Paper "there is need for a double allegiance among information service personnel

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* Research and Intelligence and Health Services Reorganisation: a Discussion Paper by the Scottish Home and Health Department, 1972

in the Health Service. Both Common Services Agency and Health Board staff in this field should see themselves as belonging to their employing authority but also working in the context of a national information service." Dr Heasman saw the information services developing by means of consultation and agreement with each Health Board and the CSA having an important role to play. To ensure economy of effort developments of new systems should take place as far as possible in one area only with the objective of transplantation to other areas when they were sufficiently developed. This required agreement between the various authorities as to who would do what but more important it meant that data must be organised in such a way that it was transmissable between one centre and another. Such concepts were not going to be easy to implement and would certainly never come into existance without co-ordination, consultation and agreement amongst those involved. Decisions on the information services of the future therefore had to be taken with both local and central issues in mind and particularly with a view to the ease of interchange of data and economy of effort in systems design.

On the question of confidentiality it was noted that two Government Committees - the Younger and Graham Harrison Committees - were presently looking at the question of privacy and computers and confidentiality. The Department were however very concerned that confidentiality was maintained and that no patient suffered as a result of disclosure of information and similarly that the doctor/patient relationship was never harmed by such disclosures.

In the case of the Universities there was no doubt that they had a role in the re-organised information services of the future. This however depended to a very large extent on the Universities themselves and in particular the Departments of Social Medicine. At present these Departments did not have the same generally accepted service role as other Departments, eg Clinical Chemistry and as there were so many different possibilities as to how they might develop it was likely that each would wish to evolve their own method of co-operation while retaining their traditional independence. Some Universities might be more interested in the development of the data processing side, others might give more consideration to the type of information that was wanted for study and evaluation at local levels, say in the divisional organisation. Such studies would be of considerable value in deciding what should be collected in any national system.

Neither the Scicon Report nor the Department's Discussion Paper implied the intention of setting up a huge and useless monolithic structure. There must clearly be considerable variation between Health Boards and in the information that they required, and this variation was to be encouraged provided it started with a common base. Naturally there would be a need for local ad hoc studies and for "soft" information which would require a different approach. In other words the Department were concerned with information for administration and management of the Health Services and to assist research workers but the definitive studies required for Health Service improvement would come from ad hoc work.

In conclusion Dr Heasman noted that although many comments on the Discussion Paper had been received relating to such matters as cost, the size of the master patient register, data release, embossed cards to assist in the capturing and recording of prescription data etc., in general, the concepts set out seemed to have been well received. All the comments received would be examined very carefully before any final decisions were

made and the full implications of the detailed systems proposed would, of course, receive further examination.

DR R C GRAHAM, Senior Administrative Medical Officer, Eastern Regional Hospital Board, began by giving a brief description of the likely functions of Health Boards. He considered these could mainly be covered under the four general headings of planning, management, monitoring and service.

Planning could be defined as any consideration of or decision on policy which tended to introduce change and since needs for health services depended on the interplay between the population, their diseases (including effects of environment) and clinical resources - all of which were constantly changing - planning was a continuing process. Information was therefore required on various factors including data about the population of each Health Board area in fairly broad and general terms. At present the Service depended on simple age/sex/population figures but through a master patient register, so that population data could readily be computed, additional information relating to such matters as social class, ethnic groups etc. should be made available. Accurate information about projected changes in population was also desirable, although in practice very difficult to achieve, and certain social factors, eg household facilities, might be important in influencing the scale of provision of certain health services.

It was also necessary to know about the disease pattern of the population served including special features of the area and how these manifested themselves as demands on services. Much useful data could be collected both locally and nationally from certain routine mortality and morbidity returns in this connection. In addition more research was required into an assessment of the usefulness of other manifestations of demand such as hospital out-patient and general practice data and, for particular planning purposes, data about demands on particular services like physiotherapy, cardiology and laboratory services. It was also possible to make predictions of needs and demands by the application of specific information collected in other areas and then published in scientific literature. The occasional collection of original data as part of a research project was also a valuable procedure.

Any consideration of need and demand for services could only be productive if it was matched by consideration of resources required to meet these demands and a precise knowledge of existing resources was required before meaningful estimates of additional requirements could be made. Here it was necessary to have manpower data relating to numbers, grades and categories of staff, information about the physical resources available in terms of scale and standards of accommodation and about the use of such facilities and knowledge of developments in treatment methods.

In the field of management, Health Boards would be charged with the task of ensuring that expenditure and allocation kept in the right relationship and for this purpose routine returns were required from the spending departments. Such returns relating to finance and other fields usually served to raise questions and indicated the need for further investigation by means of special methods such as work study and operational research. Other examples included information on waiting times and lists and also the examination of use of hospital premises by hospital activity analysis.

The function of monitoring in relation to clinical services was the area where definition of the significance of data was most difficult. The identification of perinatal mortality as an index of standard in obstetric practice had not been matched in other areas of clinical practice and in the absence of an easily identified morbidity level, whereby judgement of clinical standard could be made, one had to rely on comparisons of age/sex/diagnostic specific mortality rates for different parts of the country and which in comparisons frequently showed gross differences. A scheme for collection and analysis of information could both indicate whether or not a satisfactory level of care was being provided for the particular group concerned and also assisted in the provision of a clinical service for individual patients. Examples of this were the compilation of 'at risk' and handicap registers, thyroid follow-up schemes, cervical cytology screening and drug monitoring schemes. To evaluate the adequacy and usefulness of the levels of care provided clinical trials and random selection surveys were necessary although because of the very strong ethical considerations these were sensitive areas requiring substantially clinical participation.

Under the service function of Health Boards were covered those items of information which were useful in terms of the care of individual patients but which arose naturally from another part of the system which would be more the prime concern of a Health Board. Included in this section were schemes like immunisation programmes and services such as the provision to staff of an index of patients' clinical records - perhaps a summary of these records but not for a long time the record itself.

Dr Graham noted that the concept of a master patient register with other data about that individual linked to it by a unique identifier had been appreciated in the Eastern Region for several years. Until recently the concept had been hospital orientated and the register made up in the first place of all patients admitted to any hospital and later to all patients contacting the Hospital Service in any way. Recently the concept had been changed and the registration details of all patients in one general practice in Dundee and details of each child born in the city had been added to the register. It was intended to move towards registration details for every person resident in the Region with a system of adding births and immigrants and taking off deaths and emigrants since on the framework of this register could be hung much of the data which was routinely necessary for the efficient functioning of Health Boards. In this connection there seemed to be a case for the examination of a much closer working relationship between various offices concerned with information collection including for example, the Registrar General's Office - both central and local - and Local Authority Departments such as Social Work and Housing, and Health Boards.

PROFESSOR W W HOLLAND, Department of Clinical Epidemiology and Social Medicine, St Thomas's Hospital Medical School, London, spoke on the concept of the need and demand of a community for health care and the planning of health services in the foreseeable future. Planning was seen to be concerned primarily with the creation and implementation of policies for the best use of facilities rather than just provision of those facilities and the allocation of material resources. In planning a service a framework was proposed into which several kinds of decision making involved in the planning process were placed. The kind of decisions involved were consideration of the ideal future, setting of objective, target, allocation of resources, development and implementation of a programme and follow up and evaluation.

In practice suitable 'ideals' would become apparent from general knowledge of the current situation but to set an objective more specific data from general epidemiological research or relating to more suitable timing and methods of treatment for particular groups of people was required. Setting a target involved specifying numbers to indicate how far along the path to the objective it was hoped to go during the planning period and this decision would also require a mixture of information. Closely linked with the target decision would be that of optimum resource allocation since the target must be feasible in terms of the resources available and these in turn must be used in such a way that the target was reached at the least cost. Finally, follow up and evaluation would again require some area-specific data collected routinely but the information system must be flexible enough to allow for ad hoc studies possibly carried out by outside research teams.

The major task which the community physician would have to undertake would be an assessment of the need of the community for health care and the need of an individual for health care could be defined as that care seen as desirable by the medical profession. This need should be determined without consideration of the availability of services and resources and the need of a community for health care was therefore the sum of the needs of the individuals in the community. Some need would be known and expressed as demand while some would be unknown and demand for health care might be greater or less than the need for health care. Three major problems relating to existing information affected the met demand. These were that data related to organisational boundaries which did not coincide; variations in the methods of population projection leading to different sizes of populations being suggested for planning purposes; and variation in the type of data collected and in the method of recording, eg over different time periods. In the case of unmet demand, data was available from waiting list statistics, although the reliability of information from this source was unknown since individuals on a waiting list might not represent the true prevalence of the condition for which they were waiting to be treated.

Although the need of an individual for medical care could be defined as that care seen as desirable by the medical profession, the profession's definition of desirable care might not always coincide with that of the individual patient, pressure groups within communities or the research worker and the different factors determining whether or not need was fully met had to be isolated and examined. Fulfilment of need was dependent on patient-practitioner interaction and when the individual was aware of a medical need which was recognised by the practitioner, then, given that there were not other supply constraints, the need would be met. When the community also recognised the same need there was perfect agreement in the model. An example of this was in the case of maternity care where the three constituents, patient, practitioner and community were aware of the need for health care of the pregnant mother. This situation did not always occur, however, and in certain conditions all groups were not aware of the need for health care. In some instances neither the individual nor the community nor the practitioner was aware of the need to provide care and this situation usually occurred when little was known about the disease or when the appropriate medical care was not clearly defineable.

Professor Holland noted in conclusion that the provision of adequate information either from ad hoc studies or from routine sources was essential and in terms of area health planning it was necessary to define the problems to be solved and be definite as to what the individual authority was aiming to achieve.

MR W P LAWRIE, Assistant Secretary, Scottish Home and Health Department, noted that the consideration of manpower planning in the Health Services was a comparatively recent development within the Department, and indicated that he was somewhat sceptical about over-sophisticated information systems where the unpredictability of the individual could often affect the accuracy of the information made available. Manpower planning was in essence a means of equating supply with demand. It involved trying to find out if future expectations concerning the staff employed at present and future recruitment potential were compatible with the demands which the Health Service were expected to make for manpower. All categories of staff were relevant, whether it was the nursing administrator attempting to recruit sufficient staff to meet her present and foreseeable requirements or the Department trying to ensure that there were sufficient training schools for the professions supplementary to medicine. Although a division on manpower planning had specifically been established within the Department, the technique was also being carried out in some form or other throughout the Service and the information requirements were very similar in each case.

Until recently information on staffing levels had been collected as stock statistics at two chosen dates in the year. This had been confined to such things as numbers of part and whole time staff, male and female in selected categories (forms HS 6, 7 and 8 in the Hospital Service). In practice the method of compiling this information had not been entirely uniform or accurate and although it did give an indication of long-term trends further information relating to such matters as age characteristics, qualifications, rate of movement in and out of the service etc was required to make any meaningful assessment of the factors which created difficulties for those responsible for employing staff, and to try to take steps to make optimum use of resources.

Basic information as listed in chapter 6.1 of the Scicon Report was therefore essential for all categories of staff and should be fed as a matter of routine into the system. Much of this information was already required for payroll and superannuation purposes. The use of superannuation records to provide manpower statistics had been conceived some years ago and attempts had been made to make the system operate but, because the record was not complete as it stood (most part-time staff were excluded) and because there was no effective discipline to ensure that the central superannuation record was kept up to date, accurate information from this source was not forthcoming. Apart from the fact that honorary staff were not on the payroll, this source seemed to offer the most effective means of ensuring that personnel data was kept up to date. It was highly disciplined and up-to-date, joiners and leavers being timeously recorded and could be frozen at a particular period of time to give an accurate indication of the level of manpower available. It was likely, therefore, that in the immediate future the Service would have to depend on basic data from payroll sources. There was little doubt that any statistical recording system which was dependent on a great deal of clerical labour and checking would always be suspect and for this reason the discipline attached to the payroll system was extremely attractive. Additional information to that available on the payroll but linked to it would have to be created for ad hoc studies and the longer term step might be to make line managers or personnel departments, who were closely concerned with the accuracy of the information, responsible for data additional to that held on the payroll files. It was important to stress that whatever data on staff was collected and however this was done the requirement of management at all levels should be the main consideration.

It was hoped that the Service would make use of the information and experience gained in studies in depth carried out by the Department's manpower planning unit to demonstrate to local management the value of this information, the techniques which they themselves could use to improve their recruitment policies and to avoid management crises arising when employing authorities were suddenly faced with unforeseen shortages of staff. In the same way the information should be of help in ensuring that the best use was made of available staff and that they were employed in the categories most suitable for the local situation.

PROFESSOR R D WEIR, Department of Social Medicine, University of Aberdeen, in discussing the setting up of master patient registers considered that the first issue to be met was in the problem of definitions. He considered a register was an index of people but, by the time one or two of their characteristics had been added, the creation of a record was being approached. Another main issue was the obvious necessity to know the populations for whom particular services were being provided. The Scicon thesis was that a multiplicity of registers for various purposes was wasteful and, in addition, with increasing size and with time, registers became inaccurate and very difficult to update. Savings in costs and accuracy they argued would follow by using a single register for all purposes thereby avoiding unnecessary duplication and also promoting the updating of data by the use of and repeated turn round of the information in the register. Accepting the need for a register, discussion centred on the three issues of the extent to which a single register could be used, how accurately it could be maintained and the cost of its creation and maintenance.

It would be wrong, he considered, to set up registers without careful experiment and this idea raised a number of issues. By creating a single register or record and thereby concentrating all needs both for data and for access on a single facility at what point and size did it become inefficient or uneconomic, and would matters be better served by a number of separate clinical registers coupled with less sophisticated linkage of some items for management and planning purposes.

One could not but acknowledge the Scicon conclusion that a comprehensive computerised record was not a practical proposition within the foreseeable future. The 25-30 items of information noted in the Report were going to be added to in time and, although at present it was perhaps possible that an extended register could cope with these items, very soon a point would be reached when it was difficult if not impossible to add more data to the original register. The register or record should therefore be modular from the outset and each section thereby capable of expansion and additions. If this was so then it was likely that the different modules would have to be limited to specific functions or specific categories of data. For example, one module should be reserved to deal with identification and reference only and it was this reference module that should be regarded as the master patient register. Other modules would contain the individual patient records, statistical returns, inverted lists etc. and each individual module (as well as the total number of modules) would be capable of expansion. From these basic files the specialist registers dealing with 'at risk' groups, eg vaccination and immunisation, cancer registration, could be created as required. In short, the need for and the importance of a basic master register was evident indicating the people in the area and whether they were known to the various components of the Service.

There was urgent need for an experimental project to explore specifically such questions as could in fact a single register meet the immediate needs of a multiplicity of users and at the same time could it be sufficiently flexible to expand with the growing needs of these same users? At this stage it was necessary to ascertain whether sufficient information was available on which to make any decisions and in this connection a feasibility study was necessary to identify in detail what would be required of a single register, whether this could be met and the cost implications investigated. There was a need to examine the practical relationships between a register and a multi-purpose expanding computer record and to find out what was expected from the system. It was one thing to say the various uses to which a single register could be applied but it was another matter whether the patients, GPs, clinicians and other separate units concerned would maintain a sufficient level of co-operation in matters such as updating of information. A feasibility study could perhaps define the likely problems but only a substantial experiment could answer them.

In conclusion Professor Weir noted that a single basic master register was an attractive concept. However, such registers should perhaps not be set up until more information had been obtained. Because of the likely considerable costs and the logistic problems this information should come from an experimental register set up in three stages: (i) a feasibility study defining costs and implications; (ii) a limited register, eg combining in the first instance hospital indices, cervical cytology, chronic handicap and perhaps later cancer registration; and (iii) depending on the success of the limited register an attempt might then be made (in collaboration with the Executive Councils, Registrar General) to include the total area population. Whatever else, a means of getting answers to these matters was now of great urgency.

DISCUSSION

In the course of the discussion sessions the following were the main points to emerge:-

(1) Statistics and finance

It was noted that consideration of financial statistics had not been undertaken by the Scicon team since this would have led to an overall review of the financial position and presented difficulties in keeping the exercise down to manageable proportions. It was suggested however that financial and operational statistics which were at present compiled separately should be integrated under the new proposals. Difficulties at present existed in the functional classification of hospitals used for the costing returns and a review of this might be incorporated in any re-organisation contemplated. It was observed that in their manpower planning exercises the Department, unlike the Health Services in many other countries, found it necessary to feed in financial restraints on the basis of the Public Expenditure Survey Forecast into their estimations in the larger groups of staffing needs.

(2) Staff training

While there was general agreement that re-organisation presented an appropriate time for reconsidering the information systems available

to health authorities, it was of particular importance that, since the skills of analysis were not widely available, appropriate training should be offered to staff who would be engaged in the use of information data. The value of such training process should not be underestimated although it was noted that while the universities would wish to co-operate in such information services it was suggested that it was not their function to train in depth for this purpose. In Scotland, however, it was noted that community physicians of the future were receiving some training in this field.

(3) Feed-back and accuracy of data

Although the feed-back of certain data to the collector in such disciplined matters as finance, personnel and prescriptions would obviously ensure a level of accuracy in the material collected, in other fields, eg relating to patient data, a checking device was required to make sure that the information was valid, accurate and therefore worthwhile collecting. It was desirable to instil a feeling of professional responsibility such as was required in blood grouping and identification of patients, into other areas more remote from the clinical field. For instance the work of the pay clerk was usually carefully examined by the individual concerned while the feed-back to the medical records officer might, in some circumstances, not be so accurately checked. It was desirable to encourage the person supplying the information to use it and in this connection the line manager had an important role to play. As an example of the level of inaccuracies which sometimes did exist it was noted that of the 30m people on the Social Security Register for England and Wales it could almost be guaranteed that some 12% of the addresses were inaccurate at any one time.

(4) Needs of management

The view was expressed that data should not be collected for its own sake but should be clearly directed to management needs. It was indeed hoped that under the present arrangements information was being collected for the efficient management of the Health Service and, although in certain situations there were legal requirements for the collection of certain statistical material, eg relating to marriage and birth, there was also a spin-off in relation to other matters which was of general benefit to the Health Services. At present much useful work came from ad hoc requests for data already in existance and at the appropriate level the interpreters of data should function in the management team. It was clear that an effective information service was a prerequisite for effective management of the health services.

(5) Need for health care

The definition of need for health care as 'that care seen as desirable by the medical profession' could give rise to difficulties in such areas as the provision of social work services. The medical profession itself did indeed on occasion get pressurised by demand and it was suggested that common information systems were required to cover the social/voluntary/health service areas.

(6) Monitoring control of registers

It was most important to maintain strict monitoring control of population registers to ensure that people were talking about the

same figures. Various suggestions were made as to using existing statistical sources relating to size of population including the electoral roll, although some preference was stated for the introduction of the unique number system. In the case of population projections however fuller publication of projections fully co-ordinated with no conflicting areas, was now being made by the Registrar General and the Scottish Development Department. The size of the area covered by a master patient index was in this connection very relevant since if it became too large it became more difficult to manage and indeed a master system which attempted to answer everything might in practice answer very little.

(7) Levels of available information

All data for all purposes could not be collected at one point and it was certain that ad hoc data would still be required under any revised arrangements. Under the suggested arrangements of the Department's Discussion Paper, information required quickly at Health Board level would be readily available since Boards would collect and process the data prior to feeding it on to the central body at a later time. Apart from prescriptions nothing was suggested for collection in the Scicon Report which was not collected at the present time, and the new system would provide data locally when it was required. The proposed central organisation would as at present only require fairly simple data and it was still for consideration to judge the level of information to be collected against the likely requirements for future needs.

(8) Confidentiality

Concern was expressed for a possible reduction in the level of confidentiality on patient data within the restructured information service. It was suggested however that this tended to be somewhat overrated and that it was desirable for the health professions to take a lead in the question of public eduction on confidentiality and impress on the public the level of importance attached to this matter by Health Service personnel.

Scottish Hospital Centre
April 1972

Computers in general practice

Meeting at the Scottish Hospital Centre on Tuesday 23 May 1972

The use of computers in the community health field was discussed at this meeting. In particular, papers were presented on the methods of recording information about patients in General Practice at Craigshill Health Centre, Livingston, and Woodside Health Centre, Glasgow.

DR R C GRAHAM, Chairman of the Community Health Computer Group of the Scottish Advisory Committee on Computers in the Health Service took the Chair.

DR K T GRUER, Senior Medical Officer, Scottish Home and Health Department, in opening the meeting noted that all information had to be collected for a purpose and that purpose was that it should be used; anyone given information should be expected to use it and ideally information should be collected once and once only and should be available to all bona fide users. The problem still remained however of how to store the material, how to get at it and then present it to perhaps more than one user in a form that was intelligible to him.

The modern digital computer stood at the end of a long line of mechanical aids to calculation. It was distinguished not by any magical new power of reasoning but by being electronically controlled, automatic, general purpose and unbelievably fast. It provided a new and significant advance in the handling of information with accuracy and great speed and there was little doubt that it had an important part to play in the future progress of medicine in a number of fields and in a number of different ways. Because of the calculating abilities of computers their greatest impact had been in hospitals in the science orientated specialties such as in clinical chemistry laboratories; in radium treatment planning and in the interpretation of ECGs. They had great potential, however, in other fields, one of these being medical records and it was in this context that a computer was being used in the general practice situation in Livingston New Town.

The town lay mid-way between Edinburgh and Glasgow and by 1985 it would number about 70,000 increasing to 100,000 by the end of the century. At present its population was 16,000, 40% being under the age of 15 and only 9% over 45. Its Health Services had been planned on the basis of a centrally placed district general hospital with all the general practitioners working from health centres and each health centre having its nursing and secretarial teams. At present each doctor had his list restricted to a maximum of 1,500 patients and held a hospital appointment in a specialty. The specialist skills he acquired allowed him to act in a consulting capacity in the health centre.

Into this setting was introduced a computer assisted medical records system. In the planning of the project the decision had been reached that for at least some years to come it would be necessary for a written record to be held for each individual on the list of a general practitioner

The problems of confidentiality were particularly acute for the general practitioner. It had been suggested that a doctor should be in direct communication with his own private computer store and that no other person need then be involved in the processing stages. Doctors would have to be prepared to learn the rudiments of how to communicate with and manipulate their own computer store of information. Certainly in modern general practice, where notes might be typed and where there were nurses and social workers, confidentiality presented a problem but one of which staff were aware. The patient who might think the lack of confidentiality in computerised records a major drawback had benefits which might seem to the individual intangible. Good records had the advantage of good feedback of what the general practitioner was doing which could lead to better practice and the possibility of greater safety for patients. Record linkage might, for example, help to identify unsuspected iatrogenic disease.

The computer data for one practice had been used to show the results that could be obtained from the Livingston computer system. It was now necessary to look at the data more closely to identify the next steps. A three months sample of the figures from two doctors had been examined with a view to showing the different way doctors worked. Doctors' different styles of practice depended on their age and degree to which they were able to tolerate uncertainty, and the suggestion had been made that doctors who were not happy with conditions of uncertainty were also unhappy with abstract ideas, did not use psychotherapy, used more psychotropic drugs, made more investigations and referrals to hospital and more follow up appointments. These were in fact the broad differences between the two doctors.

Various checks on the accuracy of the data recorded had been made and these showed some quite serious deficiencies. One check showed a 2% failure in transferring data on to the computer and this occurred when 800 consultations of "high users" were compared with computer printouts. This was the group in which failure was most likely as notes were more frequently in use. There was also no check that the doctors did in fact record each contact, although there was a list of patients who were due to attend given to the doctor with the case notes. The notes of patients requesting visits were also put out for the doctor with a duplicate request slip in the notes as a reminder. Telephone conversations had been found to be very infrequently recorded and there was no aide-memoire for the doctor. Requests for repeat prescriptions had a reminder system of the same type as visits.

Constant checks were time consuming but were essential if a high standard of accuracy in recording was to be maintained. Two recent checks on the coding by secretarial staff of diagnosis for which the International Classification of Disease was used had revealed that in both the coding error was quite unacceptable; it also showed that the ICD was very difficult to use. It was therefore desirable that certainly for a short period doctors should code their own diagnoses; in this way they would get to know the limitations of the ICD which would reduce the number of coding difficulties. These existed particularly in the recording of psychiatric and respiratory disorders.

The next problem lay in making an accurate diagnosis in practice. It had been pointed out that the general practitioner more then the specialist ran the risk of being a victim of incomplete or incorrect diagnosis. Although it had been noted that it was good for the medical profession to have to make a diagnosis and the discipline involved was useful, concern

had been expressed that the computer might force the doctor to invent diagnoses since the 'system' demanded that the consultation be summed up with the title of a 'disease' and so often in practice it was the action that the doctor took which was the goal of the clinical process rather than the diagnosis itself. Perhaps there was a need to look at alternative programmes so that long and short illness could be recorded separately. There might also be improved programmes for when a change of diagnoses had to be made.

It might also be appropriate to look at other methods available for coding diagnoses. One code described by Hull (1971) comprised a five digit faceted figure; the first two digits referred to the system, the second two digits to the type of disease process and the terminal figure to the organ within the system implicated in the disease. It might also be possible to use some form of symptom recording. Morrell (1971) produced 98 separate symptoms from over 5000 different symptoms which he had recorded over a year. More might be learned therefore from symptom diagnosis and treatment than just ICD diagnoses.

Perhaps before the morbidity studies were continued a careful look at the data recorded when the patient registers might be made. This made up the 'Registration Data File' which at the moment was not as complete as it should be. There was no family linkage and this was essential both for operational research and also for updating files. The paediatricians would like much more information about the children so that they could follow up patterns of disease, and place of origin of patients could show up trends which could otherwise be missed. There were a great many details that could be recorded depending on where research interests lay and this was where a computer could be invaluable as vast stores of information could be held which might help to elucidate patterns of disease. In conclusion Dr Haines noted that although the Livingston computer system was entirely experimental the system could only process by trial and error and it was hoped that their experiences would be of profit to others concerned with this area of activity.

DR K A HARDEN, General Practitioner, Woodside Health Centre, Glasgow, spoke on a relatively new approach to data handling. The technique involved had the advantage that much of the primary data handling and analysis could be carried out in the doctor's own surgery without mechanical assistance while at the same time allowing more sophisticated analysis and compilations of statistics to be undertaken with the help of a computer. The system was based on the use of punched feature cards.

Two terms 'items' and 'features' required definition. Items in the context of the National Health Service meant the individual patient being studied. The features were the characteristics or qualities possessed by these patients and examples were age, sex, disease and treatment received. Traditional hand punched card systems were item based, ie there was one card for each item or patient and the features had to be marked on the card or punched, usually round the margins of the card. In contrast, in a feature card system each card represented a feature or characteristic of the patients. Each patient in the practice was given a unit number which corresponded to one of the numbered positions on the cards. Where a patient possessed a feature a hole was punched on the card corresponding to the position of his unit number.

Feature card systems were most appropriate where questions to be answered were feature questions. Examples were - how many patients had peptic

ulcer in the practice?, which diabetic patient had not been seen in the past year?, how many home visits had been paid in the past one month? Inspection of a card would show punched holes, for example, on the chronic bronchitis card the number of holes represented how many patients had chronic bronchitis, the position of the holes which patients had chronic bronchitis and the density of the holes the proportion of patients. By stacking two or more feature cards one might find holes which passed through the stack. These holes represented patients who possessed all the features represented by the cards. For example, by stacking the cards chronic bronchitis and male, one found which patients were male and had chronic bronchitis. The feature cards used were standard 2,500 position cards. These were chosen in preference to 10,000 position cards for ease of punching and because of the more ready availability of computer input equipment.

The practice in which the patient studies were carried out was a four doctor practice geographically divided into two parts. One group of approximately 5,500 patients was in Bearsden, a residential suburb of Glasgow, and the remaining group of approximately 3,500 was part of the 45,000 population served by the Woodside Health Centre. This report was concerned with the use of the feature cards system in the Bearsden part of the practice. Approximately 1,000 features had been allocated under the headings of Basic Data, ie sex, date of birth etc, Vaccinations, Treatment, Diagnosis, Work Load, Referral to Hospital and Laboratory Investigations.

One aim in setting up the system was to disturb as little as possible the doctor's routine practice. Hand written notes were made in the patient's case folder when the patient was seen at the surgery and, when the consultation took place at the patient's home, details were recorded on tape using a pocket dictating machine. These notes were later transcribed, the diagnosis and the treatment where appropriate was circled on the record card and, before a record card was returned to the files, the practice secretary punched the data on to the feature card. This was done by retrieving from a vertical visible filing unit the appropriate feature cards, eg a work load card, disease card and treatment card and the cards were then stacked and the position on the card corresponding to the patient's unit number punched using a manual desk top punch. The card were then refiled in the filing unit. To ensure that data was punched into the system no item of service was provided by the doctor unless the medical record card had been withdrawn from the file and no file was restored to its position without being processed.

Four types of data were being collected:-

(i) Work load statistics

At the end of each month statistics were produced:

SOME WORK LOAD STATISTICS FOR APRIL 1972

PRACTICE AT RISK WAS 5492 INCLUDING TEMPORARY RESIDENTS 13

		1st During Month	2nd During Month	3rd During Month	Monthly total
Surgery Attendances:	New (ie patient instigated)	531	31	4	605
	Emergency	38	0	0	38
	Repeat (ie doctor instigated)	240	44	21	391
	Total	809	75	25	1034

		1st During Month	2nd During Month	3rd During Month	Monthly Total
Repeat Prescription Requests:		188	38	0	264
Home Visits:	New	53	4	0	61
	Out of Hours*				7
	Repeat				83
	Total				151
Surgery - doctor and nurse:					15
Surgery - nurse only:					45
Brought to Surgery by Nurse:					18

* 6 pm - 7 am Weekdays

12 Midday Sat - 7 am Mon

Several points of interest had already emerged, eg the large number of repeat prescription requests;

(ii) Disease and at-risk index

Patients having a particular disease or in a particular age group could be quickly and easily identified, eg the need to identify all patients in the practice with a peptic ulcer could be easily done by inspecting the peptic ulcer card.

(iii) Morbidity statistics

The system had now been in operation for three months and already interesting morbidity patterns were appearing. By the end of the year detailed statistics would be prepared of the number of patients with diseases seen during the course of the year. This information could be correlated with the other facts recorded about the patients, eg date of birth, type of residence etc.

(iv) Management procedures

The punched feature cards were also useful as a management tool. For example, in immunisation procedures, the measles card could be stacked with the 'age two' card to find which patients had not yet been immunised at that age.

A number of advantages of this feature card system in general practice had already been identified. The system was relatively inexpensive, the cards costing in the region of £40, the desk punch £50 and the filing unit £100. The system could be adopted in a busy general practice with the minimum of disturbance to the doctors. Input of data to the system and output of data from the system were quick and easy and the fact that information was readily available and the statistics were immediately visible had encouraged the doctors in the practice to take a critical look at among other things the practice administration.

The system was open ended so that new features and new patients could be added as required. Although it was possible to count holes on the card by eye where large counting exercises had to be undertaken these could be

done with an Electronic Optical Scanner. Using this machine with a translation unit it was possible to generate paper tape which could be an input to the computer. The scheme thus had the advantage that while much of the primary data handling could be done in the doctor's own surgery, more sophisticated and complicated analysis and correlations between practices could be undertaken using a computer.

DR J S BRYDEN, Group Medical Superintendent, Paisley and District Hospitals, spoke of the principles behind the Woodside Health Centre project and gave his personal views on the future of computing in family medicine. The Woodside Health Centre was one of the largest health centres in Britain covering a population of 45,000 with about 20 general practitioners. It was agreed to establish for this community, first a community patient register and then a computer medical information file.

It was envisaged that each patient record would not be a vast "conception to cremation" store of every relevant or irrelevant medical incident. The system would start by simply recording administrative identification and to this would be added a type of plan where fuller clinical information might be found about the patient. Relatively fixed clinical data would probable also be added to it so that this might be used for patient recall on a health screening or therapeutic basis.

To create a community index from existing general practice list population presented differing problems from that of creating such an index in a health centre in a growing new town. One could use the Executive Council file card as source documents but these could give rise to problems and often the addresses were out of date. The alternative was to use the general practitioner's medical record envelopes EC5 and 6 as source documents. Here again difficulties might arise, addresses might be out of date and, as some of them were old, the practitioner's name might be that of a former practice principal. At Woodside it had been agreed to experiment with the new method of optical character scanning and, using this, a basic file had been created which included patient number, patient name, address, date of birth, NHS number, sex and general practitioner. It was however full of many errors and the situation at the moment was that the existing file was being cleaned for the addition of fixed clinical data.

Regular alphabetical registers had been produced which had been useful in the health centre since the filing system was numeric and this provided additional indices for the secretarial staff to look up patient numbers. Date of birth order print outs were also being given to health visitors who were finding them very useful in monitoring different age groups. Medical practices were receiving age and sex tabulation. Dr Bryden considered that this input method to a computer was probably the cheapest, costing 1 - 2 pence per average new registration on the file.

In terms of guide lines towards the future of primary medical care computing, the time scale had to be a gradual growth with patience required by all concerned and in this connection it was interesting to note that the DHSS project at Reading had been running for 5 to 6 years before the users were getting full satisfaction. There was no doubt that a register could be maintained for relatively low cost but it meant very good staff management. Optical character recognition seemed to be a possible system for any general practitioner with the use of a 'golfball' typewriter.

For a cheap simple epidemiological or patient management tool, Dr Bryden thought the feature card might be better than the off-line use of computers. The feature card required little or no expertise, was on the spot and was relatively inexpensive against the expertise remoteness and lengthy time cycle and expense of the computer. By recording every item of service, a pattern of disease and care would be obtained that would help in future treatment and planning of primary medical care. A file however which gathered such information for every patient and for every doctor would not be clinical value for money. The average number of items of service in the average life came out between 350 and 400 and each episode would need about a minimum of 20 characters of information. Would such huge patient records on a computer improve any patient care relative to the cost? It was likely that more help could be obtained with the ideas outlined behind the future Woodside clinical file with only the addition to this file of clinical items of a fixed nature with a known follow-up value.

It was well known how immunisation levels could be improved by computer "prodding" and Dr Bryden suggested that this was where one should go in the information processing of primary medical care. If a computer could be a cheap efficient means of prodding individual members of the community into prophylactic or therapeutic episodes of health care then we would be reaching towards value in health terms from health care information processing. Although at Livingston they were scheduling immunisation using an excellent print document that could be used not just for immunisation but possibly for many other recall purposes, Dr Bryden indicated that his argument was again overall on grounds of cost. Was it worth the expense of gathering and, in effect, discarding much straw and chaff for one grain of clinical value?

Scottish Hospital Centre
May 1972

Home dialysis

Meeting at the Scottish Hospital Centre on Friday 29 September 1972

At this conference the present situation relating to Home Dialysis in Scotland was discussed and a team from the Royal Free Hospital, London presented a review of their renal failure programme and its implications.

DR J STURROCK took the Chair

DR G D FORWELL, Principal Medical Officer, Scottish Home and Health Department in opening the conference referred to the recent reports of two Committees both Chaired by Lord Rosenheim - the Report of the Advisory Group on Hepatitis and the Treatment of Chronic Renal Failure* and the Report of the Joint Committee of the Royal Colleges and Associations on Maintenance Dialysis and Transplantation in the Treatment of Chronic Renal Failure.** The first conclusion of the Advisory Group's report was that there were two established and effective forms of treatment: dialysis and transplantation, and, although the subject under consideration was home dialysis, it was worth pointing out that any renal failure programme also required hospital dialysis and transplantation. As noted in this Report "The role of hospital dialysis is essentially that of resuscitating severely ill patients and of enabling them later to proceed to home dialysis or transplantation which are the natural goals from the moment the patient is accepted for treatment."

The responsibilities of local authorities and the hospital service for home dialysis were detailed in an SHHD Circular of May 1969 which expressed the hope that local authorities would use the powers available to them under section 27 of the NHS (Scotland) Act 1947 to assist patients in providing the necessary facilities in their homes. Hospital authorities were to provide and maintain the equipment and the relevant medical services as follows:

(i) the medical staff of the hospital dialysis unit would have full clinical responsibility for this specialist treatment at home as well as at hospital for patients trained in that unit; they should of course maintain a close liaison with family doctors concerned;

(ii) the hospital would provide, install and maintain the dialysis equipment for the patient's use in his home;

(iii) the maximum possible notice would be given to the local health authority of the intention to place a patient on home dialysis in the authority's area. Local health authorities would expect and should seek guidance from the hospital on the adaptation needed in each patient's home;

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* Department of Health and Social Security, and others. Hepatitis and the treatment of chronic renal failure: report of the advisory group, 1970-1972. [chairman: Lord Rosenheim]. London, DHSS, 1972.

** Royal College of Physicians of London, and others. Report of the joint committee on maintenance dialysis and transplantation in the treatment of chronic renal failure. [chairman: Lord Rosenheim]. London, The college, 1972.

(iv) the hospital would supply all drugs, dressings, concentrates etc necessary for the patient's treatment and it was for the hospital to pay for the electricity used by the artificial kidney machines;

(v) a telephone was considered necessary for a home dialysis patient and where one was not already available, or could not be provided by the patient, the cost of installation and rental was regarded as a legitimate charge on the Hospital Service.

Allowing for the difference in size of population there were about the same numbers of transplants in Scotland as in England, in 1971 there being 315 transplants in England and Wales and 38 in Scotland.

Dr Forwell indicated that, although an increase in the facilities for hospital dialysis and more transplantation alone without the necessity to develop a home dialysis programme might meet demand, it would not meet Scotland's needs. A recent survey for Scotland in 1968/69 of the incidence rate of end stage renal failure requiring haemodialysis or renal transplantation and published in the Lancet produced results broadly similar to other careful studies elsewhere. The key finding was that in Scotland only about a quarter of the estimated annual requirement was being met. It was probable that the same would still apply at present and home dialysis was necessary with more transplantation to narrow the gap. Present day treatment of renal failure had been developed relatively recently, for instance in 1965, regular dialysis was accepted as a regular therapeutic measure; in 1967 renal transplantation passed beyond the experimental stage and home dialysis was developed; in 1968 the importance of Australia antigen was not appreciated; and in 1970 testing for Australia antigen was introduced.

There was little doubt that additional resources - some more scarce than money - would be required to promote home dialysis. However the Central Department was opposed to seeking to direct Hospital Boards how to spend their budgets by making allocations specifically earmarked for developments on a national basis such as home dialysis. It was not likely therefore that the Department would provide Regional Hospital Boards with additional funds specifically for the development of home dialysis but, in the light of the reports published and the experiences of such teams as at the Royal Free Hospital, Dr Forwell felt that in time, Boards would become convinced that home dialysis was a worthy cause to which to apply some of the restricted sums available for developments in the hospital service.

MRS B GETTINGS, Nursing Officer, Scottish Home and Health Department, gave her own observations following recent visits to all the renal units in Scotland, at Dundee, Aberdeen, Edinburgh and the three in Glasgow.

During these visits and discussions with professional staff concerned it had emerged that where a policy of self-dialysis with subsequent early discharge to home dialysis was about to be introduced the staff were faced with an immediate difficulty. Patients were reluctant to consider training for home dialysis and in most cases could not be persuaded of the advantages of home dialysis, seeming to enjoy their dependence on the Hospital Service. This was an understandable attitude as they had not been educated to think about self-dialysis or dialysis treatment at home. Where new patients were admitted on the understanding that they would be trained and discharged home the problem however did not occur.

Hospital unit staff could train most patients in 6 - 8 weeks but adaptation to the home took at least 3/4 months and where problems existed sometimes longer. This gap in the timing was unavoidable and raised the question, could the local authority be given early warning before training for the patient was commenced? In some cases this was possible. On occasion there was a need for an assessment of the home jointly by the local authority staff and a member of the unit staff and this was particularly the case where the patient was from a problem family.

Following discharge an efficient and effective back-up service for the patient was most important and needed to include technical service, provision of supplies, medical and nursing advice, social work services and dietitian advice where appropriate. Generally this was provided by the hospital unit who required transport, perhaps an estate car or small van allocated to the unit for use by all its staff.

Involvement of health visitors and district nurses was unnecessary in most cases, although there were occasions where regular visiting by the health visitors was needed to give support to the family. Also, where the patient was distant from the unit, district nurses might be needed to be involved in an emergency and if so they would require additional preparation and some experience in this work.

Nurse staffing also required much consideration. Nurse recruitment was difficult, although this was not unique to renal units, but was probably exacerbated by lack of involvement of students, lack of information for nurses generally about the work and the need in a renal unit to reduce the turnover of staff to a minimum avoiding the use of agency nurses. Nurses' duta rotas might also require review where there was an increase of dialysing sessions. With regard to basic nurse training all nurses had to be given an awareness and understanding of haemodialysis possibly by means of lectures and/or tutorials perhaps reinforced with a seminar or discussion about the work with the nursing officer responsible for the unit. Also, preferably before or on appointment, a post basic course in depth was desirable for those working in the units.

First in importance however, was the subject of infection control. For the benefit of patients and the safeguarding of staff, codes of procedures needed to be well defined and practised constantly. They required to be effective, particularly if the throughput of dialysis patients was to be increased, and procedure codes should be subject to on-going review, staff being continually briefed and informed as to their purpose and importance. Nurses who were trained and had expertise in control of infection would need to be involved and participate in this aspect of renal care.

DR J F MOORHEAD, Consultant Physician and Director of the Department of Nephrology, Royal Free Hospital, London noted that home dialysis in England had been characterised by rapid growth since it started in 1963/64. The recent report of the Royal College of Physicians emphasised this but it was important to note that treatment was not yet available for all patients who apparently required it. This had been emphasised by a number of important reports particularly those by Pendreigh in Scotland, McGeown in Northern Ireland and Branch in North Wales. These reports indicated that something like 25 - 50 patients per million per year would benefit from supportive treatment for renal failure. Increasing clinical experience with patients over 55 had suggested however that they did reasonably well with home dialysis although most people would be reluctant at the present time to offer transplants to patients over the age of 40.

The figures of the European Dialysis and Transplant Association showed that a very large number of patients were being treated in Europe. Up to December 1971 the returns to the Association showed that 7,340 patients were receiving haemodialysis, 1,912 had been transplanted and that no less than 21.7 patients per million were being treated in that year. The EDTA survival figures were also extremely encouraging. Home dialysis gave the best results with 85% surviving 2 years and 77% at 5 years. Hospital dialysis showed a 71% survival at 2 years and 52% survival at 5 years and cadaver transplantation 62% survival at 2 years and 44% at 5 years. The survival figures obtained at the Royal Free Hospital compared well with the European figures, the overall survival rate being 80.7% at 6 years. The survival rate for home dialysis was an improvement on this at 86%.

Probably the three most serious medical problems from a purely clinical point of view were hypertension, anaemia and bone disease. Psychological difficulties of dialysis and transplant patients also could not be ignored and were best dealt with by firm and sympathetic training. Confidence, job satisfaction, marital relationships, schooling and many other difficulties must be discussed with the patient whenever the need arose and should be anticipated by experienced medical and nursing staff. Something like 80% of all patients with renal failure were hypertensive and about 20% of these had malignant hypertension. At the Royal Free Hospital they had preferred not to do nephrectomies but had concentrated rather on prolonged careful dialysis with gradual removal of salt and water by ultrafiltration and sodium restriction and by improving nutrition with high protein feeding and high calorie diets. To date nephrectomies for hypertension had been performed on only two patients. Only about 3 or 4% of patients had required nephrectomy and it was important to emphasise this because nephrectomy deprived a patient of almost his only source of erythropoieitin and a patient who had sustained a reasonable haematocrit would suddenly become extremely anaemic. The red cell survival time in patients on dialysis indicated that they did have a short red cell survival time but of course this was only one of the difficulties. They also had poor absorption of iron from the gastro-intestinal tract so that iron had to be given intravenously and it was possible that many factors important in the manufacture of red cells were lost in the dialysis solution during treatment.

Bone disease varied in different parts of the country. However, it was true to say that every patient with chronic renal failure had some degree of renal bone disease. Examples were the vertebrae of a patient showing the characteristic banding effect known as the 'rugger jersey spine', sub-periosteal resorption due to secondary hypoparathyroidism and the severe bony deformities that might arise in children who were not treated but might have had chronic renal failure for several years.

The solution of technical problems made home dialysis possible in the first place. Access to the blood stream was one of the most difficult problems to overcome and the most satisfactory way throughout the early and late sixties was by the use of the "Quinton-Scribner silastic Teflon" shunt. There were many difficulties with this, for example it inhibited the freedom of movement of the patient, it might clot, and easily become infected. During the last four years, the "Cimino-Brescia" arteriovenous fistula had made a considerable difference to patients on haemodialysis both at home and in hospital. To emphasise the importance of self-needling of fistulas was important since it cut down the risk of spread of blood and hence of hepatitis.

In Dr Moorhead's opinion hepatitis was not the most important thing encountered, but it was the problem which had received the most publicity. The word hepatitis itself now generated a condition which could be called "Hepatitis Hysteria". Careful attention to the latest "Rosenheim" report would generate much more confidence than had been manifested in the past in Renal Units. Out of the total number of 7,338 hospital dialysis patients, 1,227 home dialysis patients and 2,140 transplant patients up to the end of 1971, 31 patients died apparently of hepatitis. A rather larger number approaching 900 had clinical hepatitis. The Royal Free had experienced an outbreak in 1969 amongst both patients and staff when all unit patients were sent home whether or not they were trained and completed their training there. Self-needling of fistulas was introduced immediately and regular testing of both staff and patients for antigen positivity had been carried out since that time at regular intervals. Gowns, masks or gloves were not used except when there was danger of contamination from a known positive patient. Any patient known to be positive who had to come into hospital for any reason was treated in a separate building erected for this purpose, and which was equipped with closed circuit television to the main unit together with an intercom system. Two cameras were used, one focused on the patient and one on the monitor, and it was possible to instruct the patient and by watching the TV screen from the nurse's station to see that he was not getting into any trouble. Using these techniques no new cases had emerged since 1969 although every effort was made to avoid admitting antigen positive patients.

From the organisational viewpoint Dr Moorhead outlined 4 categories of centre. At the Royal Free Hospital there was an example of category 1 in which home dialysis training, cadaver transplantation, clinical nephrology were carried out and data processing was being introduced. An education function was performed, taking doctors, nurses and technicians for training both from England and abroad, and research into the problems of renal failure was undertaken. A social worker and a home dialysis administrator were in post and an important function was the unit's liaison with local authorities and essential services.

Category 2 centre, called the 'District Hospital Centre', did not yet exist but could play an extremely important role. For example, a category 1 centre with home dialysis training facilities could be built on to an academic unit where there were plenty of research facilities and could then work in liaison with 'District Hospital Centres' which provided maintenance home dialysis and minimal care hostel dialysis for special types of cases. They would also perhaps look after patients with acute renal failure and do some clinical nephrology. A 'District Hospital Centre' might maintain up to 50 patients and have an exchange scheme of doctors, nurses and technicians with the category 1 renal failure centre. The main renal failure centre could perhaps deal with 4 or 5 or possibly even more 'District Hospital Centres'.

The category 3 centre, an example of which was the Oxford Centre in England, was mainly for home dialysis training and maintenance dialysis. It could exist on its own but it was probably not efficient since transplantation was not provided.

The category 4 centre was mainly of historical interest. It was a fact that adventurous and talented surgeons introduced transplantation for renal failure but it was equally obvious now that transplantation was an episode in the life of the renal failure patient and that such a patient

would have to be guaranteed home dialysis if the transplant failed. It was unable to function on its own and would clearly have to co-operate very closely with category 3 type of centre.

In conclusion Dr Moorhead noted that he would favour the establishment of category 1 and 2 centres since this would enable the most efficient use to be made of rather scarce manpower resources.

SISTER L PAVITT indicated that there were 18 nurses working in the Renal Unit of the Royal Free Hospital including a nursing officer and staff nurses training in dialysis. Their responsibilities included dialysis of hospital patients and home dialysis patients who needed hospital dialysis for medical, technical or social reasons. Dialysis in the Intensive Therapy Unit of patients with acute renal failure or post-transplantation, and the co-ordination of medical care for the patients and training of patients for home dialysis also formed part of their duties.

Before training commenced the patient visited the Renal Unit and was introduced to the staff. If possible training was done on an out-patient basis with the patient returning home every evening. The training school worked from Monday to Friday 8 am - 6 pm and, during this time, the trainee performed his own 30 hours of dialysis, any spare time being used to prepare other patients equipment, in physiotherapy and getting to know the staff.

A high patient staff ratio ensured that the patient was observed all the time, but, when using a one-nurse/patient system, care must be taken that the patient did not become too dependant on one individual. Training was done by verbal command and demonstration and was individualised so that each patient was taken at his own pace. Goals were set progressively and all new achievements were praised.

The patient was made responsible for some aspect of his treatment from the first day. His observations before, during and after dialysis and starting and finishing were an acceptable challenge. Gradually different aspects of the treatment were introduced until he could set up and run his dialysis and, when the patient was skilful enough to prepare his equipment in one hour, he was transferred to night dialysis and direct staff support was withdrawn.

The time at which patients inserted their own fistula needles depended on the state of the fistula and the patients' eagerness to commence self venepuncture. Fistula training was always started by a doctor and, if any patient got into difficulties after going home, he returned to the Unit to insert needles in place.

When the patient was discharged it was appreciated that he was not fully trained in that, although common pitfalls had been explained to him, managing at home and alone revealed uncertainties and gaps in training. The patients were trained to use correct technical terms. Emphasis was on self dialysis and relatives received very little training apart from being encouraged to visit the Unit to receiving instruction in kiil assembly.

The home dialysis sister went into the home with the patient for the first two or three dialyses and returned four to six weeks later to see that all was well. During that period the patient telephoned the Renal Unit before each dialysis with his observations and received advice on blood pressure

and weight control. The home sister also visited patients who needed support and those whose relatives were on holiday.

The home dialysis sister was responsible to the Renal Unit of the Royal Free Hospital, was completely familiar with the hospital's training methods and with what was expected from the patients. She attended the weekly Unit meeting and reported on her work. Sister Pavitt concluded it was important that anyone helping patients in their home on dialysis should be a fully trained, competent dialysis nurse, since anyone who was not confident of her own abilities could easily destroy the patient's own confidence both in himself and the Unit.

MISS M E SELSBY, Home Dialysis Administrator, Royal Free Hospital, London, indicated that the main requirements of her post were to arrange for the adaptations to the patient's home, ensure that the necessary adaptations were completed in the shortest possible time at the minimal cost and arrange for the installation of equipment and supplies.

After being introduced to the patient by the medical staff, the administrator arranged to see hospitalised patients within the next 24 hours. Later visits took place at a time when members of the family were present and at these meetings information regarding benefits and grants was given. Where necessary the patient's Local Authority office was contacted to claim extra allowance for the expensive diet required by patients with chronic renal failure. Alternative employment might be discussed and, if retraining were required, a visit to the patient from a retraining officer was requested. Where there was financial hardship money might be obtained from either hospital or charity funds.

A visit to the home was arranged at which discussions with the patient and family took place as to which room would be suitable for adaptation. If no suitable room was available, alternatives such as an extension were discussed, and, if rehousing seemed inevitable, factors such as the proximity to relatives, friends, schools, place of employment etc were taken into consideration. The family's feeling in relation to moving out of the area were always a prime factor in the eventual decision.

A meeting was then arranged, usually at the patient's home, to discuss the necessary adaptations with officers from the appropriate departments of the Local Authority. Then a plan of the proposed treatment room was submitted showing the plumbing, drainage, electricity and storage requirements. The policy was to utilise available resources and if possible to use a room which would cause the minimal amount of inconvenience to the family. Ideally the room should be at least 10' x 10', sited near to a mains water supply and close to a drainage system thus minimising plumbing costs. If possible bedrooms were not used for dialysis.

The hospital paid for the supply and installation of equipment and stores. Each installation cost approximately £2700 per patient and maintenance costs were approximately £1600 annually per patient. This included twice yearly servicing of equipment, delivery of stores over 250 miles, the cost of staff - both medical and non-medical, electricity used by the equipment, a telephone installation (where necessary) and telephone rental charges.

Most Local Authorities were extremely generous in their efforts to help in establishing a patient on home dialysis. No charge to the patient was usually made for adaptations to council property on the understanding that should the patient have no further need of a dialysis room the family would

move to alternative accommodation and the adapted accommodation made available to another patient. Some Authorities made no charge to a patient requiring only a room adaptation but would charge the patient should an extension be necessary. Mrs Selsby noted that of the 76 home dialysis patients presently being treated in her area, only 6 had found it necessary to have an extension built. In the case of private property most Local Authorities did charge the patient after a means test although there were wide variations in the level of costs between different Authorities.

The length of time taken from the initial site meeting to the completion of adaptations varied considerably with each Local Authority - the average being 52 days. The average training time of patients during 1970/1971 was 67.7 days and the average cost for home adaptations was £310.

On completion of the adaptations the area telephone manager was informed that a patient in his area would be on home dialysis and where necessary an installation was arranged with an extension to the dialysis room. All patients on home dialysis were on the GPO emergency repair service list, since no Royal Free Hospital patient was allowed to dialyse unless a functioning telephone was within reach of the patient's bed.

Once under treatment the type of support and maintenance given to a patient would depend on what was required. The administrator made efforts to visit all patients at least every six months but, as most of the patients were at work, the visits were of necessity in the evening or during patients' holidays and always by arrangement. At these visits the stores were checked for not being over-ordered and that drugs were not out of date and an assessment was made of how the patient and family were coping with the situation. Help was given to the patient and their families to enable them to go on holiday. This could be either financial or alternatively by enabling the patient to dialyse in the hospital unit.

It was the hope of the unit staff at the Royal Free Hospital that by giving the patient confidence and the best training possible with the most efficient equipment available, by having this equipment serviced six monthly and medical staff and technicians available for advice and help, they would return to the community a rehabilitated person capable of being an independent and contributing member of society.

DR ANNE T LAMBIE, Consultant Physician, Royal Infirmary of Edinburgh, noted that home dialysis, which started as an experiment some 10 years ago, had been a well established form of treatment since 1965. The advantages were clear cut and recent surveys suggested that the numbers of persons requiring treatment for end stage renal failure amounted to 50/million of population/year - a total of approximately 270 new cases per year in Scotland. Establishment of patients on home dialysis increased the turnover and opened the way to treat a larger number of people at a lower running cost. In addition it was clear that long-term hospital dialysis was highly undesirable since it increased the risk of transmission of viral hepatitis and the Report of the Advisory Group stated that suitable patients should be transferred to home dialysis as soon as possible. The only alternative to an expansion in the facilities for home dialysis would be a considerable increase in the rate of renal transplantation and this was likely to be limited for some time by a shortage of cadaver kidneys. Moreover one had to consider the fate of the patient whose graft failed and who had to be re-accommodated perhaps permanently, on the dialysis programme. Thus any attempt to

provide a comprehensive service for the care of those with terminal renal failure would inevitably involve a considerable increase in the number of patients dialysing themselves in their own homes. There was much to be said for this from the point of view of the individual patient. The patient who had been trained to have some understanding of this disease and who had become self-sufficient in the matter of treatment felt less inadequate and was often happier. Home dialysis did away with the tedium and expense of regular visits to hospitals and in many cases caused less disruption of the life of the patient and his family. In addition it had been claimed that the more frequent dialysis possible in the home led to an improvement in wellbeing. The mortality of patients on home dialysis was also actually lower.

Problems of home dialysis however existed and these could be classified as practical, financial and psychological, becoming apparent from the moment the patient started his training. At present the most important factor limiting the number of patients established on home dialysis in the South-East Region was delay in conversion of the house and installing dialysis equipment. Responsibility was divided; the local authorities being responsible for financing alterations to the house, the hospital for the installation of equipment. It might be necessary to rehouse the patient and this involved the local housing authorities in a search for more suitable accommodation which in some areas was hard to find. In any event the exercise required the collaboration of a number of different local authority departments. The conversion of the home might be expedited if a single authority was responsible for the entire process and indeed this problem might be best solved for some patients if the local authorities were to set up specially equipped 'dialysis houses'.

The second reason for delay in establishing patients on home dialysis was the time required for training. Much depended on the attitude of the patient and, if he regarded home dialysis as an inferior substitute for renal transplantation or had been allowed to become entirely dependent upon the staff of the hospital dialysis unit, training problems would be severe. It was generally agreed that the idea of home dialysis should be introduced as soon as the need for long-term treatment became apparent, that the inter-relationship of dialysis and transplantation should be explained to the patient and that he should start his training at the onset of his treatment. Opinions differed as to the best way of training these patients: some units organised a period of intensive training during which the patient attended the unit five days a week during the day to learn to dialyse himself, to set up his machine and manage his diet. The advantages of this might be offset by loss of employment and so other centres preferred to train patients on the two evenings a week upon which they attended for treatment. This was a somewhat slower process but allowed patients to remain at work and was incidentally slightly less expensive in nursing resources. The role of audio-visual aids in training these patients and the extent to which the families should be involved were also points worthy of discussion.

Once established on home dialysis the patient still had problems. To begin with his earning capacity might be reduced and in a recent study it was found that in 60% of cases the family income had fallen while at the same time expenditure increased. When a patient is rehoused in a larger house his rent rose, home dialysis meant larger telephone and electricity bills and the allowance provided to cover these expenses was not always enough. Moreover patients on chronic dialysis did not qualify automatically for the aids and exemptions given to other handicapped people. They paid for their medicines and diet in full and in some cases this consumed an appreciable portion of their income.

Psychological stresses might be considerable. The patient and his family were aware that haemodialysis was a potentially lethal exercise and so chronic anxiety about treatment was added to the psychological problems engendered by an incurable illness. Both the patients and their spouses slept poorly on dialysis nights and one study carried out showed that the spouses actually lost more sleep in the course of a week than the patients. Uninformed neighbours afraid of infection might behave in such a way as to make the entire family feel rejected by society. Clearly psychological support had to be provided not only for the patients themselves but also for their families and opportunities must be given for them to discuss their problems. The way in which this support was provided varied from one unit to another. Almost invariably the patients received a good deal of support from medical and nursing staff of the unit but it was probably a good thing to have someone who was not directly concerned with the actual dialysis with whom patients could discuss their problems and for this reason the medical social worker had an important role in the dialysis team. It was also valuable to have a psychiatrist attached to the unit in an advisory capacity to discuss problems with the staff and to see any patients whom they felt required help.

The role of the family doctor, the district nursing services and the district hospitals in providing both practical and psychological support for home dialysis patients was rather more controversial but the possibility of invoking such help might be borne in mind particularly when considering patients who lived at a distance from the hospital unit.

At the practical level any modification of the equipment which shortened the dialysis time would be advantageous, while the development of a reasonably priced small effective disposable kidney would do much to relieve the burden of preparing for dialysis and clearing up afterwards.

DISCUSSION

In the course of the discussion session the following were the main points to emerge:-

(1) Local authority participation

Considerable comment was made on the role of local authorities and their responsibilities in relation to house adaptation and rehousing for home dialysis purposes. With regard to house adaptation two types of property - private and council houses - were involved. The latter could be adapted for an individual patient on the basis that, when no longer required by that patient, the house would be vacated to enable another person requiring the facilities to be allocated the property. In this way it was possible to build up a bank of "home dialysis houses". Private accommodation which had been adapted for home dialysis, however, tended to become 'lost' when either the house was disposed of or for some reason was no longer required for the purposes of home dialysis.

There were undoubted problems arising from the length of time required to have houses adapted. In some areas this averaged four months and such a delay in making the facilities available was unsatisfactory from the patient's viewpoint and also presented problems to the hospital in terms of risk of infection. A quick throughput of this type of patient in hospital was essential. In

view of the many local authority departments involved, eg architectural, water and surveying, it was suggested that authorities should standardise procedures by setting up a mechanism which would enable facilities to be made available with the minimum of delay although it was noted that some authorities were at present more than meeting the hospital demand for facilities for home dialysis. Close liaison between the local authority and the hospital service was of the utmost importance in ensuring the provision of the right facilities at the right time and in this connection the home dialysis administrator had a key function in association with a liaison officer from the local authority.

Although it was always desirable for patients to live in reasonable proximity to their work, rehousing, particularly outside the urban areas presented problems where houses of the required number of apartments were frequently not readily available. It was further noted that there were difficulties in producing a standard adaptation plan for houses which in most cases differed in design from each other. It was also important in this connection to make sure that adaptations for home dialysis purposes were not on a lavish scale and consideration should also be given to enabling adapted houses not immediately required in one area to be made available to patients from within another authority.

(2) Psychological approach

Although dialysis was aimed primarily at preserving the patient's life and activity within the community, it was important to bear in mind the psychological reaction which the programme of treatment could build up for the patient. Doubt as to the effectiveness of the treatment and frustration caused by delays in the provision of facilities were only two of several factors which could effect the patient's stability in re-orientating himself into his new regime. Although the importance in preserving the life of the patient was the key factor, the quality of life attained by each individual patient was also highly relevant.

(3) Finance and co-ordination

Various opinions were given as to the most satisfactory method of developing a home dialysis programme within Scotland. The establishment of a national programme with funds provided on a central basis was one possibility although it was noted that there were considerable difficulties in considering one particular type of treatment apart from other calls on resources. Because of this there was reluctance on the part of the Department to earmark funds specifically for one purpose and, although it was noted that the project at the Royal Free Hospital had initially been started on a centrally funded experimental basis, the scheme had developed considerably since 1969 financed entirely from Hospital Board funds.

In terms of the financial requirements of the health service the cost of providing an adequate home dialysis service in Scotland to meet needs was small and it was also important to remember on the positive side that the individual receiving treatment was not a total liability on the service but very much a contributing member of society.

(4) Size of problem and ratios

In Scotland there were on average 270 patients per annum who were at a terminal stage of renal failure and in terms of hospital accommodation

90 places were available for treatment. It was clearly desirable that the provision of facilities for such cases should be increased and in this connection it was relevant to compare the ratios of hospital to home provision in England and Scotland. At 30 June 1972 in England there were 500 hospital places and 750 patients on home dialysis while in Scotland at the same time there were 90 hospital places and 15 patients on home dialysis. It was apparent therefore that there was a need in Scotland for an increase in the facilities which would enable more patients to be dialysed in their homes.

(5) Staff training

There was scope for more training in relation to dialysis particularly for nursing staff in hospitals. A natural reaction against machines together with an exaggerated fear in relation to risk of infection led to difficulties in nurse recruitment for these units and it was desirable that more information on dialysis should be made available to qualified and student nurses. It was suggested, indeed, that with the high level of precautions taken in renal units, greater dangers might exist for staff in other emergency areas where a high level of activity could result in a lower level of patient care. In terms of preparing study courses for post-graduate nurses it was noted that the Committee for Clinical Nursing Studies was considering this problem and it could be expected that recommendations in this direction would be forthcoming in the near future.

It was also important to take full account of the role of the technician in the dialysis unit and, in order to develop expertise in this field, it was necessary to confer appropriate status on such posts and establish satisfactory career prospects.

(6) Equipment

A plea was made for some form of central guidance on the multiplicity of types of equipment which were available for dialysis and it was suggested that a working party might be set up to consider the situation with a view to co-ordinating the equipment used for patients undergoing dialysis.

Scottish Hospital Centre
September 1972

Computers in preventive medicine

Meeting at the Scottish Hospital Centre on Thursday 5 October 1972

Although at this conference it was generally agreed that the application of computer techniques had a part to play in the field of preventive medicine, a variety of views was expressed as to the amount and type of information which should be collected in relation to the individual patient record.

DR R C GRAHAM, Chairman of the Community Health Computer Group of the Scottish Advisory Committee on Computers in the Health Service took the Chair.

DR I D G RICHARDS, Director, Social Paediatric and Obstetric Research Unit, Glasgow, spoke on the Glasgow linked system of child health records and immunisation scheme.

He noted that many records existed on the health and development of children but normally few were linked together into personal files. Using Glasgow Corporation's IBM 360/40 computer, the Research Unit had established a linked system of child health records for all Glasgow children born from 1967 onwards. The following records were being included in the system:-

(i) an abstract of the birth notification and birth registration for each child born to women resident in Glasgow. If still-born, the registered cause was coded using the International Classification;

(ii) a health visitor report on simple obstetric and social factors related to the birth;

(iii) registration of handicap giving details of the handicap and services required. This was a copy of SHHD Form Stats HS23;

(iv) death registration;

(v) change of address mainly from health visitor notifications. There were almost 20,000 known address changes each year among the 90,000 children of pre-school age;

(vi) hospital in-patient record. Data from SHHD Form SMR1 were supplied annually on a magnetic tape by the Scottish Office Computer Service;

(vii) immunisation records derived from the immunisation appointments scheme;

(viii) school health service records giving height, weight and defects found in routine medical examinations.

In addition detailed obstetric information (SHHD Form SMRM) was now being made available and it should soon be possible to relieve health visitors of the burden of recording this kind of information for the system.

A community health information system was of value in three contexts:

Patient care

(a) To identify individuals with certain characteristics, eg the child at risk of developing a handicap, the vulnerable family at increased risk of morbidity or mortality, children due for immunisation or screening procedures and patients with selected conditions. Scheduling of appointments could be undertaken by the computer.

(b) As a source of clinical data, eg blood group, drug sensitivity, immunisation status, obstetric history and reasons for previous hospital admissions.

Management of health services

(a) As a means of ascertaining the state of health and disease of the population and of evaluating the effectiveness of health services.

(b) For detecting any exceptional occurrence, eg a rise or fall in disease incidence, an unacceptable outcome of treatment, or needs not being met by the available service.

Research: for example in studies of disease causation, the social medical factors in high risk families, determinants of child development, etc.

Dr Richards illustrated some of these applications using data from the Glasgow system for example, relating to hospital confinement rates in high risk pregnancies; perinatal mortality rates for individual hospitals; the efficiency of zoning for maternity care; and the relationship between risk status and subsequent handicap. Two other current uses of the system were described, viz. in compiling a risk register using a small number of well defined criteria (the limited usefulness of such a register was emphasised) and for scheduling immunisation appointments.

Since October 1969 primary immunisations for Glasgow children had been scheduled by computer. At an early visit to the home, the health visitor helped the mother to complete a consent form; 40% elected to have the child immunised by the general practitioner and 60% by the local authority clinic. The system then arranged appointments on a monthly cycle for general practitioners (75% were participating in the scheme) and for all local health authority child health clinics. In each cycle the first two weeks were devoted to immunising, the third was for administration and the fourth for sending postcards to parents and appointments lists to general practitioners and clinics. Other features of the system included:

(i) a fixed immunisation programme (triple vaccine and polio at 6, 8 and 12 months and measles at 15 months);

(ii) after defaulting three times, a child's name appeared on a default list for health visitor follow-up;

(iii) the system could accommodate notified changes in the times or duration of sessions and in the number of children called in a session (the usual rate was 2 every 5 minutes);

(iv) even non-participating general practitioners were sent a list of their patients due for immunisation; the parents of these children were sent a postcard asking them to contact the GP;

(v) monthly tabulations were produced to show the uptake of immunisations at each clinic; quarterly accounts of payments due to general practitioners were prepared by the computer for the Executive Council;

(vi) an explanatory booklet had been published for doctors and health visitors.

Before this scheme was introduced the immunisation level was around 66%. The current rate was 85% for triple vaccine and polio and 78% for measles; the increase was attributed very largely to the new system.

The use of a two-file system, in which identification data was separate from statistical data helped to preserve the confidentiality of the information in the linked system of records. Development costs over a 6-year period had been £9,000 for the record linkage system and £11,000 for the immunisation scheme. Annual operational costs (computer time and punching) were around £3,750 and £2,500 respectively. Dr Richards noted that this computer system of linked records was an on-going population register which, with the integration of health services, would someday be transferred to the Glasgow Health Board computer.

DR A WOOD of the Drug Monitoring Unit, Maryfield Hospital, Dundee, introduced his paper by stating that he did not intend to describe a complicated computer technique but was to deal with the application of simple computer techniques to a particular field of medicine.

The treatment of thyrotoxicosis and other disorders of the thyroid gland illustrated very well the problems of providing effective aftercare for patients who had been subjected to potent modern therapeutic techniques by the use of anti-thyriod drugs, radioactive iodine or surgery. While these measures ameliorated or eliminated the symptoms of the disease, a "cure" was not effected in the majority of patients. After cessation of anti-thyroid drugs, hyperthyroidism could recur; alternatively, therapeutic destruction of the gland could lead to hypothyroidism. Often, hypothyroidism was a late sequel to otherwise satisfactory treatment. The results of a review of patients treated with radioactive iodine in Glasgow, indicated that after 8 years about 40% were hypothyroid, much of which was undiagnosed and unsuspected. A study of patients treated surgically in Aberdeen produced similar findings with the added complication that a proportion were hyperthyroid.

Having outlined the clinical problems reference was made to estimates of the number of patients likely to be involved in future. On the basis of current treatment rates with radioactive iodine, over the next 10 years Aberdeen was likely to produce about 500 patients, Manchester 5,000, the UK 80,000 and the United States, approximately 250,000. Thus therapeutic activity presented a public health problem of some magnitude. Management

of this problem was complicated by the limited resources of general practitioners, the need to conserve out-patient facilities for truly consultative purposes, to provide convenience for patients and difficulty of maintaining contact with patients over long periods. A problem of record linkage arose between hospital doctors of different specialities and general practitioners.

In providing a practical solution to the problem responsibility for after-care must be shared between general practitioners and the hospital out-patient department. The introduction of a domiciliary care system was simplified by the fact that the "at risk" population was in sub-units of 10-20 patients per practice.

At the operations centre in the hospital, a central registry co-ordinated the follow-up between hospital, patient and general practitioner. At the time of treatment the registry was notified by the hospital doctor that the patient had been placed "at risk". The registry carried out the initial registration procedure. When treatment was complete, the hospital doctor completed a final registration procedure. The registry initiated a personal cumulative medical record which was stored on magnetic tape. At predetermined intervals the computer communicated with both the patient and the general practitioner to arrange a follow-up examination. The general practitioner fed clinical information, including a blood sample to the registry. The laboratory and clinical information were processed by the computer which produced two streams of information - normal and abnormal. From these, hospital and general practice records were automatically updated. The abnormal results were scanned in the endocrine clinic and, unless the hospital doctor indicated otherwise, patients with abnormal results were automatically recalled to the endocrine clinic.

The procedures involved were demonstrated by slides and samples of the forms used were circulated. The use of the forms was described in detail - important factors being that no radioisotope would be issued without completion of the "initial registration" form and that if a "final registration" form had not been completed, the registry automatically initiated enquiries about the patient within six months.

The format and use of forms by hospital doctors and general practitioners was described in detail. These procedures included the automatic despatch of a list to the general practitioner to obtain a blood sample. The documents used were in the form of a prestructured questionnaire with basic identification data, suitable for subsequent computer processing. Results were printed out on adhesive lables which could be retained in the patient's records.

Currently the system covered approximately 1,700 patients. The endocrine clinics at Aberdeen, Dundee and at the Western General Hospital, Edinburgh, participated and over 400 general practice units had joined the scheme.

Certain wider issues were mentioned. It was considered that there was no ethical problem as both doctor and patient consent before the computer file was used. Although there was general acceptance of the scheme, some doctors believed that patients should not be investigated unless they sought help. This was a point of view which must be respected. Regarding the question of economics, there were no direct savings as this was a new development but it could be argued that in the long term there would be indirect savings resulting from the earlier detection of disease

and that there would be better use of out-patient facilities. Communications between the hospital doctor and the general practitioner could be improved.

There was a need for more efficient, simple diagnostic methods and the system described provided a good stimulus to research in this field. Other diseases did not always lend themselves so readily to this approach to thyroid disease, but methods should and undoubtedly would be found to do this successfully with other disease groups. The medical needs of a population which had already been exposed to the Hospital Service should be examined carefully and, although computers were not essential to this process, they were certainly the instruments which had made it possible and indeed successful in practical terms.

MR J G DAVIES, Principal Scientific Officer, Scottish Home and Health Department, spoke on the benefits computers could give to Health Service information systems and of the corresponding problems. The collection and storage of data was not a new practice; nor was the use of filing systems to simplify retrieval of particular pieces of data. Libraries were an example of this. However, written records were very bulky and it was not usually possible to devise a foolproof and speedy system for assessing them. One early attempt to store data in other than a written form had been by the use of punched cards. Information could be punched onto cards: they could subsequently have operations performed on them. For example date of birth could be recorded together with other data and the deck of cards could then be sorted mechanically into date of birth order and the information on the cards printed. Cards however were still comparatively bulky and inflexible.

Early computers had not had a very large storage capacity although they had offered increased flexibility in the handling of punched cards. Computers however it must be remembered were merely machines with a capacity for performing simple operations very rapidly and were only capable of doing what they were told.

The first bulk storage which had become widely available was magnetic tape. This could be compared both physically and conceptually to the tape used on a tape recorder and increased very considerably storage capacity of computers. There were certain drawbacks however. Once information had been written into a tape in a particular order it could only be read back again in that same order. Therefore if a particular 'record' (ie a particular set of data, perhaps one individual's summary case history) of information was near the end of a reel of tape, the whole earlier portion of the reel had to be read first. This was a relatively time consuming process not in absolute but in computer terms. Perhaps one minute might be 'wasted'.

The next advance was the use of magnetic disc. The analogy here was with a conventional gramaphone record. Using discs it was possible to have a considerably larger amount of data immediately accessible to a computer and there was no longer any problem about the order of data as any item on a disc could be accessed equally quickly. There were of course cases where tape was a more appropriate storage medium and many present day computer installations used both as circumstances demanded.

Another advance in recent years was in telecommunications. It was now perfectly possible to communicate from a typewriter-like terminal in an

office to a computer via the telephone systems and for computers to be similarly linked one to another. A network of computers and terminals could be visualised perhaps with terminals at local level accessing medium sized computers at Health Boards holding basic data in turn accessing large files held on a central computer.

One of the major problems that had to be faced when considering holding large quantities of information on computers was that of confidentiality. In many ways however despite apparent public concern the problems were reduced by the use of computers. A written record in an open filing cabinet in an unlocked office was much more accessible and understandable than a set of magnetically recorded signals on a tape in a secure computer room. This was not however publicly appreciated and it was necessary for safeguard against improper access to computer held data to be good and to be seen to be good. Another related cause of public concern was the possibility of linking records held by different authorities. The easiest way to deal with this fear was for Health Service data to be held separately from all other data and for this to be stated policy.

In terms of technical problems that were raised this was a question of 'programming' ie instructing the computer on the sequence of activities to be performed. As quoted in a DHSS report "Successful implementation of data bases are still very few and have proved very expensive. Therefore before a decision to implement such a system is taken a careful assessment of both the technical and the economic flexibility is necessary."

A 'data base' could be explained as a currently accepted jargon word for a collection of data organised in an efficient manner so that where possible each item was stored once only and each user could extract his own requirements from it. Whereas in the past each user of a computer would store his own data in a way which suited himself and only he would access it, it was now desirable to avoid the wasteful duplication which this could cause. A number of users might well wish to store information about a patient: not all of them would need all the data but considerable overlapping was probable. Thus a system was called for which allowed each of them to access a comprehensive set of data but only that part which they required. It should be comprehensive to avoid duplication and to increase the likelihood of accuracy (one change would be available to all concerned from time of first notification) and it should be restricted to ensure confidentiality.

When attempting to implement a system of this nature various factors must be borne in mind besides those already mentioned. Those who needed to use it must be able to access their data quickly and easily and the cost must not be prohibitive. Cost, with computer systems in general and with information systems in particular was always a pressing problem. A natural corollary of this was the importance of evaluating computer projects and, although to do so was no easy task, it was certainly very necessary to attempt the exercise.

In conclusion Mr Davies made a plea that as a computer professional he could have some idea on the technical solutions but needed guidance on the medical ones. He did not know what data should be collected only that data should not be collected unless it was to be used. It was necessary therefore for the medical experts to be prepared to tell the computer exterts what their needs were.

DISCUSSION

In the course of the discussion session the following were the main points to emerge:-

(1) "At risk" registers

Different views were expressed on the value of "at risk" registers. On the one hand it was stated that on theoretical and practical grounds there was evidence that it was not an effective screening process. To support this in Glasgow alone it could be said that there were just as many handicapped children without "at risk" histories as those with. Alternatively it was suggested that the existence of such a register by presenting information on backgrounds just before or after a birth had made local authority staff engaged in the preventive medicine field more conscious of the problem of handicapped children and thereby increased the level of detection. There was scope however for investigating alternative methods of monitoring handicapped children.

(2) Unified records

It was suggested that in view of the diversity of various record systems throughout the country the time had now been reached when the creation of a unified record system, ie one patient/one record, should be created. Such a record which would possibly be held in a Health Centre could follow the patient when he moved his place of residence. There were problems however in knowing what should be maintained on this record and in ensuring the accuracy of data; it was not rare for an infant in its first month of life to experience six changes of address. It was considered that an integrated paper record would eventually come about as the number of Health Centres grew but it was felt that this development was still some considerable way off and the likely cost involved quite substantial. What had to be determined before any substantial advances in a linked system were made was the type of information which should be collected for medical and management purposes. A summary type record might be part of the answer although it was noted that much additional information would be necessary, possibly in sub files, to meet the needs of the various specialties. There was no doubt however that the application of computer techniques to health had made people more aware of the medical record and the type of information it contained.

(3) General practitioner involvement

In relation to the Glasgow immunisation scheme it was emphasised regarding the general practitioner involvement that the procedures were extremely time saving. Each parent was requested to bring the immunisation card when the child attended for consultation and, although the general practitioner might use his own records, his participation was minimal and payment was made automatically.

(4) Finance

Only in specific cases could it be shown that the application of computers were economically worthwhile in the health field. Apart from obvious cases such as in the payroll situation, no cash advantages were evident although it was remarked that there were

less tangible benefits available and efforts were currently being made to evaluate these in the Central Department. It did seem clear however that too many paper records were being stored at present and that any rationalisation of the various information schemes by modern applications of computer systems could save money.

(5) Teaching

There was undoubtedly an important role for the computer in the area of preventive medicine. The full benefits would however only be realised if the general practitioner and others were familiar with the optimum methods of using the information which could be made available. With a view to achieving this, there was clearly a need for medical students and young graduates to be taught the principles of data interpretation.

Scottish Hospital Centre
October 1972

Hospital commissioning

Meetings at the Scottish Hospital Centre on 13 & 20 October 1972

This report covers two conference sessions held to discuss hospital commissioning. The first was concerned with the building and technical services element and, at the second, papers were presented on equipping and staffing in the commissioning of new hospital projects.

MR A R BATCHELOR took the Chair at both conferences.

I

Building and Technical Services

MR R R C DE'ATH, Architect, Messrs Keppie, Henderson & Partners, Glasgow, in opening the conference noted that in theory commissioning for handover should be a comparatively straightforward process providing adequate procedures had been agreed to cover inspections and remedial works and other handover procedures. Rarely was this the case in practice. Without exception, at the commissioning stage, the programme began to slip and it was impossible to forecast accurately final completion dates, which gave no satisfaction to a client keyed up and ready to get on with commissioning activities.

Without much effort it was possible to identify a number of reasons why 'slip' set in at the commissioning stage including a general reluctance to carry out many of the smaller remedial items until the end of the job, inadequate maintenance and protection of completed work resulting in additional remedial work, a great number of very small activities to be carried out were difficult to programme and control, the design did not always permit a logical sequence of operations for the finishing trades resulting in extended completion times, and probably the most important single factor was the time taken to test and commission the engineering installations and the impact this activity had on other finishing trades. An examination of these contributory factors showed that both design team and client had to share with the contractor the responsibility for the difficulties that might arise. It was important therefore that a much clearer picture of what was required and how it could be achieved should be established before tender procedures were initiated.

Four examples could be given of areas in which further definition and clarification were required if the commissioning procedure was not to be delayed and complicated. The first was lack of definition and understanding of the design team's responsibility for co-ordinated design and the contractor's responsibility for co-ordinated installation. Many of the difficulties which arose were not resolved until well into the commissioning period with a consequential disruption to programmes.

The second point was the requirement that the building should be watertight before commencing installation of services. This was normally not given serious consideration at the design stage nor taken seriously by the contractor, but clearly the contract programme would be greatly extended if this requirement were rigidly adhered to. The situation could only be resolved by reasonable compromise, more consideration at the design stage and more definition of and provision for requirements in the specification and bills of quantities.

A lot of the remedial work necessary prior to handover resulted from inadequate control of temperature and humidity both in site storage and installation within the building. To specify the acceptable standards and expect them to be maintained on a building site under present conditions was too optimistic. Apart therefore from recognising the limitations on control that could be exercised during building operations and looking at specifications in the light of these limitations all that could be said at present was that some degree of control was better than none.

The last point concerned protection and maintenance of completed work prior to handover. Where there was no provision for serial handover certain sections of the project could be virtually complete up to a year before acceptance by the client. Provision was normally made in the bills of quantities for protection but maintenance received little attention. Completed works deteriorated unless they were regularly and properly maintained and, as a contractor was unlikely to pay for this out of his own pocket, some additional provision was required in the bills to cover this item.

From the client's point of view serial handover could even out the workload and resources required for equipping and furnishing the building by limiting the areas that became available at any one time and, with the overlap into the contractor's programme, reduced considerably the overall time needed for this activity. There was a strong case for serial handover to be considered more than in the past, but if the principle was accepted a variety of special conditions must be met if it was to operate satisfactorily, and these included adequate means of access and security as well as a segregation of the engineering systems in the various sections of the building. The full consequences had to be thought out in some detail at the briefing and early design stage if any of the advantages were to be realised.

The most important factor in commissioning for handover was the testing and proving of the engineering systems; this time-consuming operation, often requiring a special expertise not always available impinged also on the logical sequence of operations for the other finishing trades. While in theory demountable access panels both to the ceilings and walls should be satisfactory, in practice this technique not only interfered with the sequence of other finishing trades but, in the case of ceilings in particular, resulted in a considerable amount of damage, due to flimsy construction, both at the commissioning stage and when access was required for future maintenance or modification.

The evolution of design in hospitals over the last 20 years had made great advances but in achieving this hospitals had also become much more complicated. These more complex standards tended to be universally applied when in many cases something very much simpler might adequately provide for standards of nursing care expected today. Mr De'Ath suggested that there should be fewer but more sophisticated acute hospitals

where the aim was to provide a higher standard of specification and controlled environment, balanced with a greater number of hospitals designed for natural environmental conditions and with simplified ward and departmental requirements aimed at a more flexible use of accommodation. This approach would considerably reduce the capital and running costs of many of the new hospitals yet to be built and at the same time reduce many of the problems in the commissioning process which tended to increase proportionately with the complexity of the solution.

MR T L McARTHUR, Quantity Surveyor, Messrs A L Currie & Brown, noted that since the quantity surveyor was not involved in the strictly practical spheres of organising and of giving instructions, his remarks would mainly be in respect of difficulties concerning the major function of accounting for costs. After a building was handed over for commissioning, the surveyor's involvement was confined to the final evaluation under the terms of the contract of the work then existing, since the contractor's further working should be confined to the carrying out of such remedial works which on the instructions of the architect he was obliged to execute during or immediately after the defects liability period at no additional cost to the contract. In the large projects, due to their very size and to the number and diversity of the items to be installed, it was inevitable when the most up-to-date equipment was chosen and the latest ideas on hospital departments were incorporated that alterations, adaptations and additional works were found to be essential and these could involve significant additional costs.

Some 20 years ago commissioning appeared to the quantity surveyor to be a period when strong minded heads of department caused alterations to be made in design specifications. Then the surveyor was confronted with an ever-increasing stream of day work accounts from the various trades which increased the final account substantially above the forecast figure. In recent years with the increase in hospital building there was a methodical approach to commissioning by personnel whose duty was to plan ahead, and there was a greater awareness of the duties and needs of the others who were involved in all the aspects which were necessary to the successful completion of the project. Through the medium of planning, design and cost control meetings the surveyor was now kept aware of proposals and decisions and consulted in all matters affecting costs. In this way many of the factors which had proved to be common to the commissioning of projects already dealt with would be planned out of the commissioning period by the design team with probable saving in cost and certainly saving in time.

There was already evidence in current projects that decisions previously not made until after the handing over date particularly in respect of equipment specifications were now being made during the building period thereby enabling variations in provisions to be made and costs to be suitably adjusted. The greatly improved methods of dealing with the whole carrying out of current projects should now provide the means to solve and control the problems which were unavoidably carried into the commissioning period.

One other factor which could affect commissioning was where a new building was handed over in sections or where a project comprised several units, some of which might be taken over before practical completion of the whole. If this arrangement had not been written into the original contract however it could only be carried out with the consent of the contractor.

Serial handover had advantages for the contractor in that he benefited financially by receiving a proportion of the retention money relative to the section immediately it was handed over and he received the remaining proportion at an earlier date than he otherwise would. Benefits to the hospital authorities were that an early start on commissioning procedures could be undertaken and certain departments could be put into use at an earlier date.

MR I C KIRKWOOD, Consulting Engineer, Messrs Hulley & Kirkwood, spoke on the engineering aspects relating to the administration of commissioning. He noted that, because hospital engineering services had become increasingly complex to meet more sophisticated demands made upon them and were installed in partially completed buildings, it was not surprising that installations had from time to time fallen short of the client's reasonable expectations and for one reason or another had given cause for dissatisfaction.

As it appeared therefore that traditional procedures within the building industry were not adequate the Department of Health, to improve the position, decided to introduce commissioning procedures for hospital engineering services. In August 1967 Hospital Technical Memorandum No 17 - "The commissioning of hospital engineering services" - was published defining the activities of the various parties involved and introducing two new concepts:- (i) the appointment of a commissioning engineer and (ii) the introduction of commissioning manuals.

Commissioning manuals covering the majority of engineering services used in hospitals were published by the Department of Health and Social Security in 1970. With the availability of this guidance material projects presently being planned were required to comply with procedures now defined.

To meet the recommendations of HTM No 17, which in themselves raised a number of problems, the client had to recognise that the commissioning procedures involved additional staff and that he would be required to appoint a commissioning engineer. He might either appoint a member of the Hospital Board staff, an independent commissioning team, or the consultant might be asked to undertake the additional duties of the commissioning engineer. The respective duties of the design engineer, site staff and the commissioning engineer had also to be defined. The object of the commissioning procedures was to ensure that the service installations when completed complied with the design intent and that the hospital engineering staff was shown the correct working of the installation and received, before handing over, the relevant documentation service manuals and users' handbooks. The procedures also ensured that the tests carried out before and during site construction were adequately documented.

Mr Kirkwood then referred to the duties of the various parties insofar as they specifically referred to the commissioning process.

The clients had established the brief or design intent, had appointed a design engineer, resident site staff and a commissioning engineer and had accepted contracts for the work.

The design engineer would be either the Regional Engineer and his staff or an independent firm of consulting engineers. His normal duties were to prepare the detailed designs, drawings, specification and contract

documentation on which a contract was let and to ensure that the installation was carried out by the contractor in accordance with the terms of the contract. To meet the hospital commissioning procedures he would have to be instructed to prepare commissioning manuals for the services he had designed and to ensure that the site resident staff completed these manuals as inspections of the work were undertaken during the construction. He would have to ensure that the results of the tests recorded in the commissioning manuals met the specified requirements before the certificate of completion was issued.

The contractor would be expected to complete the work, test it and set it to work in accordance with the contract requirements.

The site supervisory staff ensured that the contractors fulfilled the detailed requirements of the contract. This included checking to ensure compliance with the specification and drawings; witnessing acceptance tests to ensure that contractual requirements had been met; completion of the appropriate sections of the commissioning manual and witnessing the final balancing and adjustment of the system at the end of construction and if required during the early client occupation.

The commissioning engineer had been appointed by the client to carry out final commissioning after the issue of the certificate of practical completion and to evaluate the performance of the plant. During construction he would probably carry out spot checks and might query any tests being witnessed by the site supervisory staff. As the work neared completion he would check the documentation which would be handed to the hospital staff. He would finally be required to report whether installation met the design intent.

The hospital engineer would be instructed by the contractor in the operation and maintenance of the plant. Before taking over the plant he would receive adequate documentation on the details of the plant and the acceptance tests applied to it. He would also be required to initiate a system of maintenance to ensure that the plant was kept in correct working order.

In conclusion Mr Kirkwood restated the object of the commissioning procedures - to ensure that the installations complied with the design intent and to ensure that the hospital engineering staff was properly briefed to take them over and maintain them.

MR I G HANNA, Consulting Engineer, Messrs Donald, Smith, Seymour & Rooley, Glasgow, said that it should be the object of the design engineer to provide accessible facilities for monitoring the plant while still running so that test readings could be taken and recorded without dismantling the plant. Only in this way could commissioning be properly carried out. At the same time plant layout and access to equipment, ie valves, was an inherent part of the design function which if not carried out properly could create difficulties during the commissioning process. The design engineer's specification should be quite specific in the statement of requirement leaving the installing contractor in no doubt as to the design intent. The extent of testing which would be called for must be made clear to the contractor.

In regard to specifications there appeared to be a slow movement towards a national standard for service installations. The eventual rationalising of installations would eventually in time make commissioning a

formality. But however standard the specification might be, a basic requirement to provide satisfactory commissioning was good engineering in the early design stages.

Before work commenced on site the contractor was usually required to produce a network programme and, while acknowledging that responsibility for the programme rested with the contractor, the tendency was to have a handover date on completion of the work of the finishing trades and omit the commissioning activity altogether. Adequate time should be included within the contractual programme for the contractors "putting into operation" activity together with a further commissioning activity for the design team. The time allowed for each activity should not be underestimated and for a hospital of the order of 600 beds the extent of the programme activities could be of two to three months for both the contractor's "putting into operation" and commissioning team's testing period.

The appointment of site supervisors by the client in no way absolved the contractor from providing his own supervision and too often the tendency was to offer a defective installation and leave the client's representatives to discover the faults. In effect commissioning began with the installing contractor's supervision and testing as the installation proceeded.

It was extremely rare to have a site engineer experienced in both mechanical and electrical installation work and a plea was made that consideration be given to the appointment of essentially electrical supervisory staff. Using the same argument of complication and sophistication in plumbing services, similar reasoning could also be applied for the appointment of supervisory site staff for plumbing installations.

The role of the hospital engineer in commissioning was important. The contractor should give instruction to the hospital engineer in the operation of plant, but no greater experience could be gained by the hospital engineer than by being associated with the design team and with the site supervisory staff, particularly in the period leading up to and during the actual commissioning by the contractor and by the commissioning team. It would be in the interests of the hospital in regard to future maintenance if the hospital engineer's appointment together with that of his electrical counterpart could be made several months before the completion of the contract.

In conclusion Mr Hanna noted that his own firm were addressing themselves to the possibility of creating a specialist flying squad team for commissioning work using the experts which at present were located either in London, Glasgow or Manchester or Aberdeen. The combined experience of such a team particularly after several commissioning exercises could only improve the commissioning process and this idea might commend itself to the relevant authorities.

MR J TIMONEY, Chief Clerk of Works/Site Co-ordinator, Western Regional Hospital Board, stated that in his opinion commissioning was a continuous process embracing the total period of the contract and extending beyond the completion stage. This total period could be seen to have five main divisions:-

(i) commencement of early work on site;

(ii) pre-ceiling erection stage;

(iii) pre-handover;

(iv) handover;

(v) post-handover.

Period 1

The first commissioning problems emerged with drain laying and the installation of buried services. With periods of sometimes 2-3 years elapsing before many of these services were required it was of the utmost importance that their locations were correctly charted and that adequate protection was afforded them.

Period 2

It was particularly important that all works in ceiling spaces were in an advanced stage of completion prior to the erection of the ceiling. Some typical examples of incomplete work included:-

(a) service holes in floors for piping etc were sometimes redundant, often oversized and not always infilled.

This might be because work such as the making good to service holes and the like was not always profitable to the individual detailed to carry it out. The work was uninteresting and the difficulties not always appreciated. There was also a general failure to appreciate the dangers inherent in the situation.

These comments applied equally well to penetrations of fire compartment walls;

(b) the insulation to plumbing and heating pipes was often incomplete.

This could be due to a difference in the performance of insulation contractors. Plumbing and heating were quite often also dealt with separately in bills of quantities;

(c) difficulties arose in relation to colour coding for services and identification of valves.

Here a difference of performance of contractors was also relevant plus a failure to appreciate the difficulties of maintenance staff in the future;

(d) branch lines from main services were frequently not complete.

This could occur where information was outstanding in respect of fixtures or specialist equipment or where damage had been caused by other trades.

wall linings and areas of sheeting being left off while some equipment was tested could be a problem. Balancing and regulating by use of hidden dampers etc was a much worse feature of commissioning.

People presented problems by just walking about a building. When they asked for what might appear minor changes in certain areas this could easily lead to complete redecoration of whole areas and their consequent recleaning.

Mr Maxwell considered that a partial answer to this problem was more designed sectionalisation; progressive acceptance and sectional completions meant greater security, less risk and less retained money. Work finished once progressively and positively meant a cheaper, better, faster building. The opposites of these were the builders besetting problems.

DISCUSSION

In the course of the discussion session the following were the main points to emerge:-

(1) Liaison and co-ordination

Hospital commissioning had to be treated as a planned procedure and could not be treated as a formality. It was essential that there should be close liaison and co-operation between the various professions involved during each stage of the process. There were great advantages in those involved having regular progress meetings rather than dealing with matters by correspondence, and an appreciation of each others' problems and disciplines and a consistency in language and viewpoint were important in ensuring an effective commissioning process. Continuity in personnel from an early stage was invaluable in achieving an appreciation of the design intent of individual schemes. In this way it would be possible to overlap the planning, design and construction stages which it was suggested were dealt with at present in too sectionalised a fashion.

Since the technical officers on the hospital's staff were to be responsible for the service element of new units when they were handed over, it was most desirable that such staff, eg the hospital engineer, building supervisor etc should be involved in the early stages of construction and given access throughout to the site and testing data as they became available to enable them to become acquainted with the building and operation of the services incorporated in the scheme.

(2) Testing and proving of engineering works

Considerable comment was made on the testing and proving of engineering components in new hospital building. It was suggested that although commissioning was a continuing process it was in effect a post-contract function and could not be carried out until the building had been handed over. Testing and proving of engineering services however should be undertaken as a pre-completion exercise although it was considered that in most instances it was left too late in each scheme. It was for consideration as to

whether the engineering trade were in fact properly equipped to undertake the testing and proving of the complex services being installed in modern hospitals, and whether the contractor understood or was informed of the actual facilities required for the proper procedures to be carried out. Engineers at an early stage in the building progress should make known their requirements for this and it was essential that provision was made in the design for the testing of such services. In this connection the importance of access points was emphasised.

(3) Contract letting

Under existing procedures the view was expressed that the time taken from the initial planning stages to the final completion of a new hospital was excessive. If it were possible for the builder to become involved at an earlier stage in the proceedings some telescoping of the programme would be possible but it was noted that, where public money was involved, in most cases the builder could only involve himself after formal tendering procedures had been undergone. The possibility of letting a job out under a negotiated contract might be one way of enabling a builder to participate at an earlier stage in a scheme, but it was noted that such a contract, under which every item received a fair price, was invariably more expensive and that in practice it was expected that some level of competition should be achieved.

(4) Hospital design and building

In designing and building a new hospital one of the main objects, it was considered, was to keep within the cost allowances and take into account the wide range of guidance material available on hospital design. It was felt that the fact that public money was involved however tended to increase the various bodies participating, and to which plans had to be submitted for approval. This 'over involvement' of the various categories of staff in turn lent itself to an increase in the level of services asked for and there was a danger of the buildings and service installations becoming more complicated than was necessary. There was possibly a tendency to incorporate all the latest developments in new units and there was need for a careful definition of requirements in relation to the actual categories of patients to be treated in those units.

(5) Handover

Particularly in the case of major schemes there was a need for a more formalised handover at which keys, instruction manuals etc could be passed over to the users. Serial handovers of sections of hospitals presented difficulties in terms of engineering services, but in the case of completed phases there were clear advantages in this arrangement for the contractor, and also the hospital authorities, regarding control and security of equipment and getting the facilities into use as soon as possible.

(6) Standardisation

It was remarked that an increase in the level of design standardisation throughout hospital wards and departments would greatly reduce the problems associated with the commissioning of new units. With the

development of standard units based on research on functional requirements, acceptable work patterns would be identified which could be used in instructing staff moving into new units. In this connection there were advantages in the use of mock-up techniques to enable staff to preview and become acquainted with working areas before the new accommodation was ready for occupation.

II

Equipping and Staffing

In opening the conference DR D M McLELLAN, Medical Officer, Scottish Hospital Centre, speaking from a continuing interest in new hospital projects and, in particular, discussions with the commissioning team at Northwick Park Hospital, noted that commissioning should commence as soon after the building phase started as possible. In larger schemes this could involve the use of critical path analysis and computer techniques to co-ordinate up to 200 different streams of activity which made up hospital life. For each stream of activity it was necessary to have an operational system to achieve the objectives by the necessary organisation of staff and physical resources and to prepare operational policies which should be written up as operational manuals.

An operational system might be defined as the necessary organisation of people, things and information to achieve a specific object. These could be divided into two main groups - management and departmental. In management systems were those policies of operational systems that determined the operation of the hospital as a whole. They were essentially the framework of hospital management within which the working of each department was defined. The departmental systems were classified according to the way in which they assisted the achievement of the primary objective of delivering specialist medical care. They included the clinical departments, environmental departments, nursing services, medical service departments, auxiliary departments, specialist departments, administration and the university. If this classification was adopted the complex organisation of the modern hospital could be broken down into its basic components, leading to the following advantages:-

(i) the information from a variety of sources might be handled in a manageable form;

(ii) responsibility could be clearly allocated to individuals;

(iii) priorities and a programme could be determined;

(iv) objectives for out-patients, in-patients, teaching and research could be stated with a reasonable amount of precision; and

(v) working groups of those likely to be involved particularly for the departmental systems could be set up to devise methods of achieving the objectives within the resources which would be available.

The local problem should be related to the fundamental objectives of the commissioning team which were that:

(i) there should be planning of commissioning to ensure efficient operation of the hospital;

(ii) no function of the hospital should be overlooked in the process of commissioning;

(iii) all who work within the hospital should have a clear written guide to assist them with their work;

(iv) the functions of the parts of the hospital must be related to one another and to the function of the whole hospital; and

(v) the functions should be classified to determine priorities and to formulate a programme and a time-table. These might have to be modified because of factors arising out of the construction programme.

The staff available for commissioning large projects should be organised into sections comprising the *project group* - to handle outstanding details with the design team and the contractor; the *systems group* - to devise the necessary operational systems with the users; the *equipment group* - to handle the equipment programmes; the *finance group* - to prepare estimates of running costs; the *university group* - to deal with problems arising from the medical school; and the *co-ordination and control group* consisting usually of the senior officers of the Board of Management.

The co-ordination and control group having up-dated the relevant information from the briefing, design and construction phases should agree objectives with the clinical and environmental departments. This might involve revision of some of the objectives and major policy decisions. Having agreed the objectives the working groups were established which must include representatives of the potential users. They were provided with the relevant information from the management systems, details of the accommodation and the equipment likely to be available, probable staffing levels and any other relevant information. The working groups then set out to devise methods of achieving their objectives with the resources which would be available. It was important to set a time-table and date lines which must be met. Operational manuals were prepared and finalised for each system after discussion with the co-ordination group. In the case of the management systems, which had a diffuse influence and covered a large range of topics, a standard format was unlikely. For the departmental systems however a standard format was possible to cover the general and detailed objectives, information from the relevant management systems, a description of the resources, ie staff equipment and accommodation and listing of departmental procedures with, if necessary, job descriptions, time-tables, flow charts etc. The manuals should provide a record of the system for use by heads of departments and the appropriate senior officers, but should not be regarded as being a rigid rule book or being inflexible since they had to be updated to meet changing situations affecting objectives and resources. Systems books using summaries of the operational manuals should be prepared for wider distribution to ensure general briefing of hospital staff as a whole. Comprehensive training programmes involving all grades of staff should be devised on the basis of the manuals and implemented well in advance of the commissioning of the new buildings.

In conclusion Dr McLellan stressed the need for a systematic approach to commissioning and noted that, if work on operational policies was started early enough, many of these policies could be implemented in whole or in part in advance of the occupation of the new building.

A paper by MR W A BROWN, Principal Assistant Secretary, Western Regional Hospital Board, was given in his absence by MR J LEITHEAD, Director, Scottish Hospital Centre. To find the source of many of the problems which arose at the commissioning stage of any large hospital building project one had to go right back to the early planning stages. At that point the planning team were preparing schedules of accommodation briefs, looking at departmental relationships, operational policies, equipment requirements etc, in consultation with the users. Inevitably a relationship developed between the planning team and the users, mutual

understanding if not mutual agreement was reached on planning difficulties and solutions, but with some kind of assurance to the planning team that the proposals were acceptable.

With the appointment of the design team, the original planning philosophy had to be expounded and explained to another professional level and interpreted in terms of relationships, services, rooms, circulation spaces and communications. In time another relationship developed between the design team and the planning team concerning client authority, information sources and responsibilities for costs. Inevitably an informal link developed with the design team and the users and this also became translated into the plans and the design team's solution.

The contractor was then appointed with whom the client had a legal relationship but to whom the client could not communicate directly - only through a design team. It was important contractually that the instructions to the contractor were passed only via the design team and therefore everyone in the client's camp was encouraged to stay away from the building site and not permitted to have any communication with the contractor.

As the building neared completion there was a need to think about appointing staff, buying equipment, revising operational policies and deciding how the unit would work and how it would fit in with existing services. When the building was accepted and the architect issued his certificate of practical completion, because all the planning procedures had taken a long time to accomplish and personalities had changed, the commissioning team and users came face to face with a building which they did not plan, design nor construct and for which they did not write the original operational policies. It was not unusual therefore for the users to establish everything which could possibly be wrong with the building, the decor, the furnishings, engineering services etc and this was understandable and quite proper.

To improve the situation there was still a need for better understanding among the many persons needed to plan and commission hospitals, of each other's job and the essentials of each contribution. There needed to be, for example:-

(i) better communication between planners and users throughout the process - regular reports from the planning team to the potential users;

(ii) systematic education of the user's technical staff by the design team on building detail and engineering services during construction and while the building was in the contractor's hands;

(iii) an earlier start to commissioning as a joint exercise with the planning team. Planning team thinking and expertise must be passed on to the commissioning team and also the reasons for controversial decisions. This was particularly important in the equipping of the new hospital where many planning decisions throughout the planning process might have decided a choice of equipment otherwise baffling to the user;

(iv) a smooth continuity between planning the unit and commissioning;

(v) better, more accurate estimation of progress and completion by design team and contractor;

(vi) planned risk-taking in recruiting staff to achieve early use and an acceptance of the risk by the administration;

(vii) last minute consultations on equipment which might have changed or might not now be available.

(viii) better time-tabling by the contractor on the installation of group 1 and 2 equipment and planned training or instruction on its operation where necessary;

(ix) an appreciation among users that a certificate of practical completion meant that the building had been brought only to an acceptable state of completion;

(x) an appreciation that many engineering services could only be adjusted and balanced when the building was in use - and some initial discomfort to users had to be accepted;

(xi) a realisation that any hospital building had cost the taxpayer a great deal of money and that there was a common duty laid on everyone to bring it into service as soon as possible.

MR C W KING, Project Leader of the Commissioning Team for the Stage 2 Development of Aberdeen Royal Infirmary, spoke on the preparation of lists of equipment for new projects. He noted that not only would the original planning of any new unit have repercussions on the equipment lists but so also would staffing policies and operational policies. Very often existing supply arrangements would dictate equipment needs and this was especially true of laundry and CSSD services. Again the degree of staffing available at particular times would affect equipment needs.

In the preparation of equipment lists the aim was to produce a list for each room of the new project and cumulative lists of every article required in the new hospital or department. It was important that a common language was used so that an item once described continued to be talked about in that way. This could be effected by bringing together a representative committee of hospital personnel with a view to determining the basic requirements of each and every room using as a basis for this the recommendations contained in hospital equipment notes. In view of the large number of room lists which could be needed, clearly the computer had much to offer by way of reducing the very considerable work involved in the preparation of basic lists and the production of costed lists.

Consultation with users was essential but had to be controlled. It could go too far and a multiplicity of views expressed about specific items of equipment could cloud the specific issues involved.

Detail was important in respect of routine items used for nursing and medical care. Attention often seemed to be riveted on the larger and more dramatic items of equipment and care had to be taken not to omit the small but vital items. Also of importance was the making or obtaining of decisions on the equipment requirements to be listed for approval by the Department. People's attitudes to equipment lists varied considerably and it was essential to arrive at a reasonable decision which called for a good deal of balancing, stimulation and diplomacy by those whose responsibility it was to ensure that the equipment lists were finally completed in as correct a manner as possible.

Very often in the preparation of detailed equipment lists the officers concerned would be speaking with people who had not been engaged in the detailed planning but who would transfer to the new wards or departments. This therefore might often be the first contact which hospital staff had with a commissioning officer or team and it was essential that the right approach was made. A great deal of the work in hand would be foreign to the staff who would ultimately transfer and it was essential that proper guidance was given at this early stage in the orientation programme which was the compiling of the equipment lists. It was the duty of those responsible for the preparation of the equipment lists to provide the essential service of smoothing the path for those who would ultimately use the equipment in the new areas.

When the room and cumulative equipment lists had been completed for a particular floor or department, the next task was to price the items and at this stage it might well be that the particular type of equipment had not been positively decided but simply a decision taken that one particular unit required a standard adjustable height bed. Financial allowance had to be made accordingly and the need for precise definition undertaken as quickly as possible.

Three points should be considered by all who had some responsibility in the preparation of equipment lists. First, the difficulties which could arise with the transfer of active departments from a hospital to a new development. While clearly specialist equipment must be transferred the area, eg a ward which was to be re-occupied must be left intact for the incoming unit. If a ward were transferring, basically all that should move was the patient and the patient's record and then any specialist equipment which could only be used by the out-going unit. There was a natural desire to take familiar things however and this could be disastrous if not controlled both for the old and the new situations.

The second point was to "assume nothing" in the preparation of equipment lists. Questions must be asked to make quite sure that everything was accounted for.

Thirdly it was essential to remember that new policies or new ways of working in a particular project might have repercussions well outside the new hospital or department and that for a time new policies in one part of the hospital might have to be worked along with the old. For example new theatres might be provided for by a theatre tray service while existing theatres continued with present methods of working. If the TSSU was outwith the hospital then it would have implications on transport and handling and all this must be borne in mind and accounted for in equipment terms.

MR H HOGG, Principal Assistant Secretary (Supplies), Western Regional Hospital Board, indicated that his department of some 60 persons had an overall responsibility for equipping or seeing equipped all major capital building schemes.

Because of the large number of projects in the Western Region it was decided to adopt a system of having preparatory information available by way of stock sheets to help prepare lists of equipment for every hospital area of interest to the planning teams. In consultation with the appropriate staff, ie planning and design teams, these were varied to meet the requirements of differing briefs and plans. The details for

each item were then consolidated and costed and later, after funds had been approved, the lists were revised to take account of up-to-date hospital requirements and variety reduction.

Advantage was taken of all central or national contracts and where possible existing regional or specially negotiated contracts were imposed on the balance of requirements where this appeated to be profitable or desirable. This did however leave a large quantity of items which required to be studied and ordered with little or no price negotiation benefits arising. For these items the system adopted was to aggregate similar types of equipment on schedules wherever possible to make them attractive to specialist markets. This form of action also ensured that there could be a system of budgetary control over the expenditure to ensure that it would be kept within the bounds stipulated by the Scottish Home and Health Department.

Mr Hogg considered that a set of equipment commissioning activities started prior to contracting. These included ascertaining buying groups, controlling the flow of items through various departmental sections and timing procedures with a view to ensuring timeous delivery on sites. However a major commissioning activity was ensuring ordering of the necessary goods without duplication or oversight. A very systematic approach was required at this stage and library information about specification and suppliers was as essential at this stage, particularly for the "direct buy" items, as at the contracting stages which preceded.

Most goods would be received at stores established for this purpose. Large well heated and dry areas were required for storing expensive and delicate equipment. However, mechanisation procedures should be adopted so far as possible since mobility was a key factor. When goods had been delivered they required to be identified and then identified again to show their destination which should be related to a planned numbering system for convenience. Other problems affecting the storage of goods related to fire and safety precautions and the maintenance of plant and machinery in good order.

In relation to the delivering of items to hospital sites, the types of vehicles and associated minor equipment required for any particular project required to be related to the stores facilities for loading, to transport facilities available and to site conditions. Protection of lifts, floors and walls from possible damage while trucking or opening crates etc and disposal of waste material, eg wrapping were of some importance.

In summary Mr Hogg indicated that the development of the Regional Hospital Board supplies teams had ensured planning information being available reasonably early to planning and design teams and goods always being available when required by each project. They had ensured high quality goods being purchased at highly competitive prices and achieved user satisfaction with the vast majority of goods provided by taking into account, whenever possible, users' views at every stage in the procedures.

MISS A H COURT BROWN, Chief Regional Nursing Officer, Western Regional Hospital Board, spoke on the forecast estimation of nursing requirements for a major development. She noted that such an estimate was of approximate needs for a future hospital development and was required for a number of purposes. Once the brief of a new major development had been prepared and before the full schedule could be completed, it was necessary as an aid to the planners to ascertain how many staff were to be accommodated in dining areas, changing accommodation etc. so that figures could be produced which would act as a guide to the estimation of the square metres required. The timing of this exercise could be as much as 7/8 years ahead of the commissioning of the hospital. It was also necessary in order to prepare a preliminary budget estimation which would lead on to the allocation of resources in advance of the commissioning date. Also the forecast estimate was helpful as an aid to advance recruitment.

The building programme in the Western Region was at present the largest in the UK and some reasonable method therefore had had to be decided on round which estimations could be made. In 1966/67 there was little available material on how such estimations could be arrived at and it appeared that up to that time people quoted vaguely one nurse for two beds without any real basis for arriving at such a ratio. It was therefore necessary to produce something more realistic and the method adopted was of building up by planning duty rotas. The situation was projected six years ahead to think in terms of the 40-hour week on a five-day basis, more realistic night cover and better supervision of nurses in training and the use of nursing auxiliaries. It was considered that a new district general hospital should reach at least an 88% average occupancy rate and this was used as the norm. In terms of the Falkirk Ward the difference between intensive nursing care in the 12 beds as against intermediate care in two 30-bed supporting wards was estimated. Hospital Planning Note No 6 on out-patient departments was an invaluable assistance and time was spent in a new operating theatre suite to find out the functions of a nurse and estimate how these would change with the provision of a TSSU service. Efforts were also made to ascertain the staffing differences between a general surgical ward and that of ENT, gynaecology, orthopaedics etc. In this way a formula was produced to cover the basic staff required for a 72-bed floor and this was built up to include the total number of floors and beds added to which were the basic staff requirements for operating theatres, accident/emergency departments, OPD etc.

This figure however purely gave the basic ward requirements and from this the division of grades of staff had to be decided. A realistic percentage addition for the problems of sickness and absenteeism, holidays and reliefs for the student/pupil nurses for their time in the classroom and secondment outwith the hospital was then calculated. With the percentages arrived at and the totals of basic staff and nurse administration figures it was possible then to arrive at a grand total.

About this time the report on the evaluation of the Falkirk Ward was published. This contained an examination of the staffing levels required for this concept of design and it was interesting to note that the Falkirk ratio was only approximately two nurses to 72 beds different from that arrived at by the Western Region's team. This confirmed that a realistic formula had been devised which would enable a whole series of estimations for future hospitals in the Region to be made.

In 1971 the Department accepted the use of the Aberdeen formula to be used nationally for calculating nurse staffing levels although it was appreciated that it might be some years before either the right grades or the finances would be available for that level of staffing everywhere. This formula was still the most realistic presently available provided it was used on individually calculated patient dependency factors for each ward.

Although making forecast estimations for future hospitals was one exercise there came a time when that hospital was commissioned and a time even later when the results could be tested. In the West two patient dependency studies had been undertaken in new maternity hospitals and these had gone a long way to proving the work which had been begun 5-6 years ago and had shown a breakthrough in the forecasting of nurse manpower needs for areas where there were new hospital developments. It was now possible to produce the figures up to the early 1980s and with obvious adjustments for training, hours of duty etc it was quite possible to project estimates for a further 10 years.

MRS M G SAUNDERS, Adviser on Domestic and Ancillary Services, Scottish Home and Health Department, noted that if a new hospital or department was to replace an existing unit it was most desirable that the domestic superintendent in post should be consulted and invited to planning meetings particularly where matters relating to domestic staffing and equipment, floor coverings etc were under discussion. However a new project altogether was usually different as the domestic superintendent would not be in post until about six months before the hospital was due to open. In these circumstances the commissioning team provided figures for a basic establishment which might or might not be acceptable to the domestic superintendent who had to allocate her resources to the best of her ability. To arrive at a satisfactory establishment in relation to the areas to be covered it was therefore essential that the views of experts were sought, and Mrs Saunders indicated that she was readily available to commissioning teams as the adviser in the Department for guidance on staffing in specialised areas.

The norm used in the Department for basic cleaning duties was 3.5 hours per bed per week and with the advent of non-nursing duties a further ¾ hour making the total 4.25 hours per bed per week. In hospital departments the figure used was 1 hour per 1000 sq ft. These figures had proved in practice adequate for the domestic staffing of a hospital. In the case of new projects the domestic administration should be consulted to determine how many of the non-nursing duties detailed in SHM 16/1972 would be undertaken by the domestic staff. It was also helpful to know the type of patient to be expected in each ward area and the pattern of the in-patient day so that skeleton work programmes might be prepared which would be acceptable to the nursing staff. In terms of domestic equipment there was now a list prepared by the supplies branch of the Department and this served as an adequate guide in the preparation of equipment schedules.

The domestic superintendent would be given the commissioning time-table showing when the wards and departments would be ready to be handed over to the hospital authorities. At this time she would be interviewing and carefully selecting staff for the new unit, arranging for equipment and cleaning materials to be brought from the stores and deciding which treatment was going to be best for the floors and what the future maintenance programme was going to be. Arrangements were made for the domestics to start training in how to use the equipment and the methods which were

going to be used in the initial cleaning of the hospital which took place before the arrival of patients. When this work commenced the domestic superintendent was required to keep a record of the faults which showed up in the building when it was cleaned for the first time. During these initial cleaning stages many such faults were brought to light and work was frequently interrupted by workmen entering parts of the unit due to "snagging".

Mrs Saunders noted that the domestic superintendent's job was to create a clean, bright environment for the patients. A hospital was meant to be used - dirtied and cleaned - and it was the task of the domestic services both to prepare a hospital for opening and also to keep it acceptably clean for the medical and nursing staff in their work with the patients.

MR W P LAWRIE, Assistant Secretary, Scottish Home and Health Department, spoke on the rather wider interpretation of the resources affected by commissioning - the beds and facilities in the catchment area of a new hospital as well as money, staff, equipment etc. In this context it was important to be aware of the "commissioning" problem at a much earlier stage than a few years before the opening of a new hospital and it was probably not overstating the position to say that the resources required for commissioning a large new hospital had in many ways been determined some 10-15 years before commissioning actually took place.

When agreement was reached in principle that a new hospital of a given size would be built, a decision was reached on the number of beds after consideration of the requirements for the area in the particular specialty and of the existing facilities in that area and their place in the future organisation of hospital services. At that point it was decided to what extent the resources in relation to staff, money etc required for the new hospital would be a gross or net addition.

On the question of determining the finance for the running cost of the new hospital, which was the overriding factor in determining whether or not all the other plans could be brought to fruition, Mr Lawrie noted that at an early stage in the growth of the hospital building programme it was realised that exceptional measures were required to cope with the problems of providing resources for new hospital building. In some way the system had to ensure that the new building could be opened, that money and staff were available, while at the same time not creating too great a differential between the new building and other parts of the service nor interfering with the freedom of decision of Hospital Boards to make decisions on priorities within their own areas. The system had been refined as time had passed but basically it consisted of estimating the work-load of each department of the new hospital and applying to this a unit cost thereby producing the estimated expenditure. The work-load estimate was obviously partly based on existing experience in the area to be served by the hospital and partly on the expectation of better service to patients and was clearly subject to a certain degree of error. Unit costs could be related to and compared with the costs being incurred in similar departments elsewhere in the country. There was also a clear need to relate these financial figures to projected staffing levels.

A new hospital which replaced an existing unit had never been opened which was cheaper to run in spite of all the advances in technology and design. The buildings and services were more efficient but to make progress a higher standard of service was expected and was provided in

the new building. It was difficult to strike the right balance between better standards and the level of services in older hospitals but in general a 5% betterment had been aimed at, although as much as 25-30% had been suggested in some instances. It was also necessary to put in hand timeously the arrangements for closures of units where appropriate, as the complexities of actually closing a hospital or reducing beds was well-known and frequently gave rise to difficulties at local level.

The hospital building programme was now almost entirely into the replacement phase. Most of the gaps in the service relating to maternity and geriatric facilities had been filled and in some cases might have been over-provided. Therefore, if no more beds were to be provided and possibly fewer to be used more intensively in most specialties, there should be no need to provide any net additional resources to run the new buildings. No doubt there would be continuing improvements in the standards of service but in the future there should be no need to single out the commissioning of new buildings for special treatment in the distribution of financial resources. It would be reasonable to expect that each Board could finance out of its share of the expected annual growth percentage the improved element of service in new building, making its own decisions against other priorities in the area as to the extent of these improvements. One qualification might be that some adjustment in the distribution to Boards might be made to take account of any increased work-load in any specialty or supporting service which was shown to be required and facilitated by the provision of new building.

It was important to remember that the problem of commissioning would continue in the reorganised Health Service and that in some Health Boards at least the actual experience of commissioning a major new building would be so infrequent that there would be virtually no existing expertise in that Board. It was interesting to consider the commissioning exercise, whether or not this should be undertaken by extra or existing staff, in parallel with the impending reorganisation of the Health Service in 1974 which, as a commissioning exercise, posed exactly the same problems.

DISCUSSION

In the course of the discussion session the following were the main points raised:-

(1) Operational policies

It was essential in preparing the functional briefs for the architect that operational policies should be considered and documented. It was likely however that in the light of developments taking place during the planning and building stages, some adaptation in these policies would be required and these should be crystallised and incorporated along with the basic principles in the operational manuals prepared immediately prior to the commissioning process.

(2) Commissioning team

It was pointed out that there were clear advantages in having on the commissioning team officers who had been involved in the planning of the hospital from an early stage. In this way the original concepts of policies could be explained to the users and the intention of the

functional planners realised. There were difficulties in a protracted scheme, however, in maintaining continuity of personnel throughout the various stages involved and by and large there were probably advantages in making advance appointments of senior staff for new units. It was noted that, if necessary, finance set aside for commissioning could be made available 3-4 years in advance of the actual completion date. In relation to the commissioning team it was most desirable that it should be representative of the various categories of staff who would be involved in its future running.

(3) Equipment

Depending on the quantity and/or type of equipment involved for new projects, there were various methods of purchase which could be used to gain the most favourable terms. Most important were the central contracts negotiated by government departments and those arranged regionally by Hospital Boards; it was noted that in the Western Region variety reduction of 1300 items in day-to-day use in hospitals had been achieved on a Regional contract basis. This degree of variety reduction had been attained after close consultation by supply staff on user requirements in association with finance officers and, where appropriate, designers and although certain areas of contention undoubtedly existed, with a flexible approach and co-operation by all concerned, types of equipment could be agreed on which were generally acceptable.

Although it was appreciated that in the years which had elapsed since the issue of the equipment notes by the Department considerable developments had taken place, it was indicated that the notes were still of value as a basic guide to equipment requirements. It was noted however that the sum of up-to-date guidance on hospital equipment was at present being written in to a computer programme. This would provide a new basic equipment code which would be available on a package basis throughout Scotland to hospital staff involved in commissioning procedures. In view of this it was felt that there was probably no need for the Department to issue revised equipment notes.

(4) Revenue estimates

There was value in estimates being made as to the cost of commissioning and running new units. It was noted however that such information was principally for use at local level since on a national basis, where currently approximately £20m per annum was allocated towards the growth of the Hospital Service, the cost of commissioning the few number of new hospitals being opened was relatively small taking Scotland as a whole.

Estimating however could probably not be realistically done early in the planning stages, since there were considerable difficulties in producing figures on running costs at that time which were sensitive to fluctuations which might occur in anything up to 10 years between the planning and commissioning periods of new hospitals.

(5) Manpower planning, recruitment and training

Manpower planning, particularly in relation to the professions supplementary to medicine, merited a high level of priority

in relation to new hospital developments. Although recruitment into schools of nursing should clearly take account of future development, the scale of entries in relation to the practical training facilities available was largely a decision for local management. On the other hand regarding some other professions such as physiotherapy, radiography etc future needs required consideration on a national basis and it was desirable that information collected locally should be pooled and examined centrally to assess future requirements in this area of the Hospital Service. Particularly in relation to these professions it was also noted that there was a substantial wastage of staff soon after completion of training and it was important to have regard to schemes which kept in touch with such staff with a view to encouraging a return to service at a later stage.

In terms of nursing staff although Boards were always encouraged to look ahead, problems existed in the early recruitment of nurses for new developments. Such staff "temporarily" housed in other units might in the event be reluctant to transfer when the new hospital was ready for commissioning and there was no method of compelling staff to change their place of work. There was also the problem of timing nurse recruitment for new units against the risk of delays in completion of schemes which might result in those recruited taking employment elsewhere.

(6) Closure of hospital facilities

In considering proposals for the development of new hospitals, rationalisation of services was an accepted policy. This inevitably meant that in certain situations some existing hospital facilities would be closed and this might involve moving staff from their place of work where there was strong local pressure for them to remain. In general it was noted that in Scotland the total number of hospital beds had decreased over the last few years and this was likely to continue although the situation would vary from area to area. Decisions to close units and the implications for staff involved however should clearly be made and communicated to those concerned at an early stage and relating to this it was noted that there was a clear set of procedures to be followed before any decision as to the closure of existing hospital facilities could be reached.

(7) Reorganisation of National Health Service

It was likely that before the reorganisation of the National Health Service in 1974 the Building Division of the Common Services Agency once established would take over from Regional Hospital Boards the management and control of major hospital building schemes which were at a critical stage of their development. This would enable the current building programme to 1980 to proceed without delay during the interim period while Health Boards were being set up and thereafter. Present priorities in the programme were likely to remain unchanged under reorganisation.

Scottish Hospital Centre
October 1972

The nurse and research

Meeting at the Scottish Hospital Centre on 27 October 1972

Recently published reports relating to the management and organisation of the nursing profession had stressed the need for research with the aim of improving levels of patient care and at this conference five nurses gave papers on their work within the Department of Nursing Studies at the University of Edinburgh.

DAME MURIEL POWELL took the Chair.

PROFESSOR MARGARET SCOTT WRIGHT, Department of Nursing Studies, University of Edinburgh, in opening the conference spoke of the Department's major interest since its inception in nursing research. There was a need within the nursing profession for such research which could develop a whole new field of knowledge on matters relating to the profession. The interaction of the theoretical and practical aspects of care, so carefully studied in medicine, had been almost entirely lacking in nursing - little money had been made available for this purpose and there was a decided shortage of staff with the necessary expertise in this type of work. There was a definite need for the scientific study of the delivery of the best method of nursing care.

Increasing demands were being made on the range of care and service given by nurses as key members of the health team and this expansion of the nursing role would be accelerated by the impending integration of the National Health Service. It was necessary to consider the wider contribution that the nurse could make herself as a member of a multi-disciplinary team. With nursing the most costly component in terms of numbers of the health service, manpower planning was another matter requiring consideration in order to conserve the abilities and skills of qualified personnel. An effort had also to be made to fit quality and quantity of care together - these were not separate entities but part of the total concept of providing satisfactory nursing care in every setting for every category of patient.

There was a need therefore to train research workers specifically for this highly complex specialised work. At present very few nurses were undertaking this type of activity since there was little association between the nursing profession and the universities which were the cradle and mainspring of research 'know how' in any discipline and in this connection nursing was no different. Ideally a centre should be available to establish research and which would be staffed by individuals who had been involved in nursing research activities themselves. At such a centre the profession could share in the enterprise with the operators, and close contact between staff and the profession should be maintained by organising such activities as summer schools and meetings of research information groups. There was also a need at such a centre to have sufficient numbers of nurses with research experience to help with the supervision of research fellows.

MISS LISBETH HOCKEY, and colleagues of the Nursing Research Unit then gave a brief introductory comment on their functions within the Department of Nursing Studies. The unit served as a common base for people engaged in similar activities, providing initial support and, by way of dialogue and discussion, constructive criticism in research work being undertaken in the nursing field. In this respect the unit provided equipment for other members of the Department of Nursing Studies in connection with their teaching functions and also individual studies.

Various professions were represented within the unit and a multi-disciplinary team approach was adopted as a co-operative effort in research aimed at improving the standard and quality of nursing care for the patient. The establishment of the research unit also enabled a continuity of effort to be maintained whereby in a stable setting hypotheses and tools could be tested and evaluated over the years and, where appropriate, certain studies repeated in different situations.

Recently published reports on nursing services had clearly underlined the importance of this type of research work being further developed and although, no doubt, there would be certain obstacles to be overcome, the unit was now firmly established and the pattern of activities clearly set out with a programme of work aimed at improving the level of patient care.

An aspect of communication within the National Health Service

This study by MISS MARGARET CLARK, Senior Nursing Officer, Glasgow Royal Infirmary, concentrated specifically on the area of the patient's discharge home from hospital and the aims were:-

(i) to examine the verbal and written communication from the hospital to both the patient and the general practitioner at the time of the patient's discharge from hospital;

(ii) from the views of the hospital staff and the general practitioners, to discover what they considered to be desirable in communication at the time of the patient's discharge from hospital and how far in practice these ideals were met;

(iii) from the results of the study to try to highlight areas which required further investigation;

(iv) to see if there was any evidence to suggest that any unmet needs existed at the time of the patient's discharge from hospital; and

(v) in view of the proposed unification of the Health Service in Scotland to see how much liaison there was at present between the different branches of the service included in the study.

Background

Miss Clark's interest in the subject had been stimulated by experience both in the community and in hospital. Close examination of previous studies had shown that there were areas of deficiency in communication at the time of the patient's discharge from hospital. As resources for the study were limited simple methods had to be devised for collecting information from patients who had recently been discharged from hospital

and also for discovering about communications from the hospital to the general practitioners, and the study had to be restricted to patients discharged home from acute medical wards only.

To obtain the information three groups of people were approached - recently discharged hospital patients, general practitioners and hospital personnel (consultant physicians and ward sisters) - and questionnaires were used.

Methodology

(1) Selection of hospital and sample of patients

A teaching hospital agreed that a randomly selected sample of patients being discharged home from 10 medical wards (5 male and 5 female) could be followed up. A time of 12 weeks was arbitrarily placed upon the sampling period with a follow-up period of 17 days at the end of the study (this figure representing the average length of stay in medical wards during the 3 months prior to the study).

Wards were visited each morning and the nursing Kardex examined to identify the patients who had been admitted during the previous 24 hours. With certain small exceptions all patients admitted during this period were included. Daily, on completion of the list of patients fulfilling the necessary criteria, each patient was allocated a number and from this a sample was randomly selected by drawing 5 numbers each day. Once the patient had been selected for inclusion in the sample the Kardex was checked daily until the patient's final disposal was noted. All patients then discharged home would be the final sample excluding (i) those taking their own discharge and (ii) those discharged home within 48 hours of admission.

(2) Sample of general practitioners

The sample of general practitioners included all the doctors of patients discharged home and included in the sample, although it was decided to limit the number of questionnaires to any one doctor to 2 during the study period. Within three days of the patient's discharge from hospital a questionnaire was posted to the general practitioner stating a date about one week hence when the interviewer would call at the surgery to uplift the completed questionnaire.

(3) Sample of hospital staff

A postal questionnaire was sent to all ward sisters and consultant physicians connected with the wards from which the sample of patients was selected.

Results

(1) Patient sample

The total sample of patients was 376 and their disposal was as follows: 62.8% were discharged home; 18.3% transferred to another hospital; 8% transferred within hospital; 8% died in hospital; and 2.9% remained in hospital at the end of the study period. For various reasons it was found possible to interview

only 132 of the patients discharged home. This was largely due to the fairly substantial number of patients who could not be found at the address given and had this been anticipated at the outset closer follow-up of hospital records would have been undertaken.

Perhaps the most important finding was the patient's reaction when asked about the amount of information which they had been given about their illness while in hospital. 25% claimed they had been given no information at all: 73% said they had been told by a doctor and 2% said they had been told by the ward sister or their GP. 71% felt that the information they had been given was adequate, 29% felt it was insufficient although no-one felt they had been told too much. Other questions regarding the patient's knowledge about diet, drugs, out-patient appointments etc were asked.

On the whole, patients were satisfied with arrangements made for their discharge from hospital and 85.5% expressed complete satisfaction regarding this. 96% of patients felt that the length of warning of impending discharge had been right while 4% considered it was not long enough - this group stating that difficulty in contacting relatives had been their problem.

All but two of the patients requiring some kind of physical help at home following discharge, eg district nurse, home help etc did in fact receive these services and in this respect there did not appear to be any area of unmet need. Some lack of supportive services in the less tangible area of general counselling was indicated however by the fact that 27% of the patients said they had experienced some kind of problem on which they would have welcomed advice. Such areas were health, finance, help in the house and problems resulting from the lack of information given to the patient while in hospital, eg regarding diet and mobility at home.

(2) General practitioner sample

128 completed questionnaires were returned representing a response of 86%. When they had completed the questionnaires 104 knew of their patient's discharge from hospital and had been notified in the majority of cases by a brief discharge letter. A large percentage however did consider that the full discharge summary took too long to arrive and it was interesting to note that the consultant physicians also felt that this was the greatest deficiency in the present system of communication from hospital to GP. Many considered they were not contacted often enough regarding the patient's social conditions and another area of problem was in not being notified of changes in the patient's condition while in hospital.

(3) Hospital staff sample

In general, hospital staff appeared to be in agreement on most points which had been raised with patients and general practitioners. Some diversity of opinion existed concerning the person who should be responsible for co-ordinating the arrangements at the time of the patient's discharge from hospital. Many thought this function should be undertaken by the patient's

own GP, some by the hospital medical staff, some the ward sister and others the medical social worker. Some ward sisters did not appear to consider that they had any part to play in this.

Summing up, Miss Clark indicated that the aims of the study were achieved and as a result pointed out that several further areas had been suggested as being possible sources of further investigation either to gain more information in more depth or by experimental studies.

An aspect of operant conditioning and behaviour modification

MRS ALISON TIERNEY, Research Fellow, Department of Nursing Studies, University of Edinburgh, began by indicating that one of the possibilities of training the subnormal, which was increasingly gaining attention and credibility, was that of behaviour modification. This technique, based on psychological theories of learning, focused on a specific observable behaviour - the response - as well as those events which reinforced and maintained this response. Behaviour modification was the systematic application of the experimental analysis of behaviour and provided the conceptual and theoretical framework of her study.

The implications of the study for nursing were:-

(i) to explore the potential of the nurse in subnormality to develop educational skills;

(ii) to explore and if possible to attempt to alleviate one of the problems in mental deficiency hospitals, ie incontinence; and

(iii) to make some contribution to the development of nursing research in general and in particular to the development of experimental methodology and design.

Recognition and formulation of the research problem was initially made on the basis of a review of available literature in relation to the toilet training of mental defective patients. The environment selected for the study was a ward in a NHS hospital for the mentally defective.

Main study

This was preceded by pilot studies and was in four main phases:- (1) pre-experimental phase; (2) experimental phase; (3) post experimental phase; and (4) follow-up evaluation phase.

(1) Pre-experimental phase

This was undertaken for a period of 30 days and aspects studied involved categories (a) patients; (b) staff; (c) environment; and (d) incontinence.

Research methods employed were structured and unstructured observation, questionnaire and abstractions from documents.

Aspects studied with relation to (a) patients:-

(i) General characteristics of population of 52 mental defective patients.

(ii) Assessment of MA and IQ of each patient by the researcher and psychologist to indicate the present level of functioning of each patient.

(iii) Details of individual patient's case history were obtained.

(iv) Functional analysis techniques were employed to provide an individual behavioural analysis of incontinence of each patient and an isolation of individual reinforcers.

Aspects studied with relation to (b) staff:-

(i) General characteristics of the staff population.

(ii) Record of nurse:patient ratio.

(iii) Questionnaire to staff working in the ward to gain data on role perception, attitudes to incontinence, knowledge of behaviour modification and other training methods etc.

Aspects studied with relation to (c) environment:-

(i) General characteristics of the institution and the ward.

(ii) Specific characteristics of sanitary annexes and equipment.

Aspects studied with relation to (d) incontinence:-

(i) Incontinence and toilet behaviour of individual patients. This was undertaken by continuous observation and recording of all episodes of incontinence and toilet use of each patient throughout the 30 day period, 24 hours/day, ie 9890 episodes.

(ii) Approximately 200 of the episodes were observed with a view to gaining detailed data of patterns of behaviour displayed by individual patients.

(iii) Linen wet or soiled, was counted and recorded throughout the 30 day period. A total of 9343 items was recorded, a daily average of 311.

(iv) Observation of nurses working in the ward situation was undertaken to determine the workload on nursing staff in activities relating to incontinence and toileting. A total of 19 nurses were observed over a total period of some 24 hours, using a random time sample method. 241 work activities were recorded and categorised in relation to incontinence (22%) and toileting (17%).

(2) Experimental phase

This phase was scheduled to run for 90 days and was at present 1/3 of the way through. Two main aspects of toilet training were being considered:-

(i) bladder and bowel training to aid the acquisition of bowel and bladder control and

(ii) toilet behaviour, ie training the patient appropriate behaviour centred on using the toilet.

The main principles of the toilet training programme were that all appropriate toilet behaviour was reinforced using the technique of behaviour shaping, that all inappropriate toilet behaviour was ignored and that all incontinence in toilet

behaviour was observed and recorded. Within the main principles of the application of behaviour modification techniques the programme had been designed to accommodate the training needs of the individual subjects. The training environment, times to be toileted, reinforcers, equipment to be used and other aspects were specific to individual subjects.

In this experimental phase therefore an attempt was being made to toilet train a group of severely subnormal and incontinent patients. In order to define what toilet training implied an extensive amount of recordings were made during the pilot studies of observed response topographies in elimination. These observations had been used to establish a model of "shaping" toilet behaviour. This was being used to allow target behaviours to be set for individual subjects at various times in the programme and to serve to record the progress of individual subjects continuously throughout the programme. Both aims also served to provide the trainers (ie nurses) with essential information about individual subjects within the context of the principle of the programme. The other method of indication of ongoing effects on the programme was that of the maintenance of a cumulative record of elimination responses of each subject.

Staff training

One of the most important areas of a programme utilising behaviour modification was the training of nursing staff in the principles and practice related. Between the pre-experimental and experimental phases a training programme for nursing staff in the ward was undertaken over a 2-week period. Basic principles and techniques of behaviour were taught including such aspects as reinforcement, shaping behaviour, extinction, observation and recording of behaviour, schedules of reinforcement, and fading.

The next stage in nurse training would be to introduce some of the more complex but essential principles of behaviour modification and to reduce dependency of the nurses upon the researcher to allow them to come to recognise and solve problems, make decisions and to infer from data subsequent steps of the programme.

Mrs Tierney noted that the principal difficulty in carrying out the main study had been instability and insufficiency of staff. Although 35 nurses were involved in the initial stages of the study only 9 remained at the pre-experimental stage and 11 in the staff training programme. Insufficiency had also arisen for various reasons but the problems of caring for 52 active subnormal patients with a nurse:patient ratio varying between 1:17 and 1:10 were obvious. Problems also existed in running an experimental training programme with staffing at this level.

A study implemented in the ward situation implicitly implied the necessary co-operation of ward staff. Statistical results of this study could indicate such staff factors as instability or insufficiency but would never indicate the factors responsible for the implementation and hopefully the success of the study - those of the diligence, patience and enthusiasm extended by those nurses who had been involved.

Incontinence and nursing practice

MISS ESTHER REID, Nursing Officer, Scottish Home and Health Department, in presenting her paper indicated that her research had been conducted into one aspect of incontinence and in more specific terms was "an investigation of the rationale of the nursing management of soiling in non-bedfast patients". An attempt had been made to establish not only *how* nurses attended to such patients but also to identify the more difficult question of *why* they did so in any one particular way. Miss Reid noted that the origin of the work arose from her work at the Scottish Hospital Centre as a nurse member of a multi-disciplinary team engaged in detailed hospital planning.

Incontinence was not a disease but a symptom and crossed many boundaries - sex, age groups, social class and hospital classification. However the very old and the young, and persons with severe mental and physical handicap, appeared to be affected to the greatest degree. The incidence of incontinence had been variously estimated for long-stay wards - particularly geriatric/chronic sick - where a study had indicated an increase from 20% in the 1950s to over 40% in the 1960s to 51% in 1972.

In the community, incontinence was much more difficult to estimate but it had been suggested that 1:4 of the population could suffer from it towards the end of life and that approximately one-third would be affected for a period of up to one year. When this was placed alongside population projections for the next 20 years, in which an increase of 34% was anticipated in the number of persons over the age of 75, the number of potential incontinent persons had formidable implications with regard to nurse involvement and the provision of care.

In relation to the provision of hospital beds in Scotland 50% of the total complement was occupied by persons aged 65 and over. The long-stay component formed at least 50% of the total complement of 64,000 beds, similarly the age level of persons in hospitals was constantly rising. There were, however, only 5% of all elderly persons in hospitals or residential homes, the remainder living in the community either by themselves or with relatives, and it would therefore seem that in the new integrated health services the community nurse would have an increasing role to play in the care of the incontinent person.

One of the most important causal agents precipitating incontinence was the accompanying mental impairment which had been estimated to be present between 75-80% of incontinent patients. This in turn placed a considerable responsibility on nurses for the provision and maintenance of nursing care, particularly so when patients did not, and could not, respond and when there was a total communication block making explanation of practices impossible. The response of the individual incontinent person was possibly the area in which nurses showed the greatest concern and this aspect was certainly inherent in the nursing philosophy of preserving the integrity of the person irrespective of situation or condition.

The responsibility for the cleansing aspect on the whole rested with the nursing staff and it had been known for incontinent patients to be returned from OT and physiotherapy departments to be attended in their wards by nurses. It was implicit therefore that not only did nurses know how to do this but that the facilities were there to assist them. This nursing commitment therefore had little interference from other disciplines and it was unlikely that there would be any change in this in the future.

The main efforts with respect to incontinence had been channelled and concentrated into research into the aetiology and the methods of containment and the benefits derived from active rehabilitative and retaining programmes. Miss Reid indicated however that her research dealt with the examination of the practice and management of soiling. In the course of the study a wide range of social service techniques were used to obtain the data including questionnaires, direct observation and recording, check lists, continual analysis and case studies. Broad areas which were examined in relation to the practice included:-

(i) education concerning the theoretical content and the performance observed in the wards;

(ii) resources in terms of manpower, equipment and materials - the practice could not be satisfactorily undertaken unless certain conditions were fulfilled;

(iii) environment with reference to the physical structure of the ward, to identify the constraints within which the nurse worked;

(iv) overall organisation - the management of the ward and the place of this practice in relation to the whole work pattern; and

(v) patients - to identify the physical and mental characteristics of the patients in relation to the practice performed.

In conclusion Miss Reid noted that there were many difficulties in carrying out this research, the identification of practice possibly being the most taxing. Above all she noted that there was the moral responsibility of the researcher in observing and examining the performance of a nursing practice directly associated with patients mainly in long-stay wards who were in great part unable to object in any way to her presence.

An enquiry into the job of a Unit Nursing Officer

MISS JENIFER WILSON-BARNETT, Night Sister (Medical Unit), St George's Hospital, London, said that her subject had been chosen as the basis for a research study because of its controversial nature and because it was considered to be a useful area in which to provide information. Debates had taken place on the relationship between the nursing officer and the charge nurse and some people feared that the charge nurse's position would be diminished when it became subordinated to the immediately superior administrative and clinical post of unit nursing officer. The specific aims were as follows:-

(i) to provide a profile of the qualifications and nursing experience of the unit nursing officer;

(ii) to collect their opinion on their work situation, their responsibilities and relationships with others, and the Salmon Report and merit rating;

(iii) to provide a guide as to the amount of time spent on different areas of work such as administration and professional work; and

(iv) to describe the every-day activities of the unit nursing officers and establish whether a common core of activities was performed by most of them.

Methodology

A combination of research techniques was used. The structured interview was useful to establish that relevant topics were covered and gave opportunity to emphasise that the study was not evaluative of nurses' work. Request for an observation period was also thought to be more successful in a face to face situation.

After a 4-week pilot study it was decided that 66 questions should be included in the interview schedule and that continuous observation should be employed for a single day duty for a sample of the nursing officers. The study was confined to Scotland where in June 1971, 224 nursing officers were in post on day duty in the service area and of these 106 were working in five hospital groups that had implemented the Salmon proposals. 100 interviews were carried out - 23 in psychiatric or mental deficiency units, 13 in midwifery and 64 in "general" nursing which included long-stay, medical, surgical, specialist and mixed units.

Results

1 Qualifications and professional experience

In this group 60% had been assimilated from their previous positions and 40% appointed after interview. 83% were appointed at the time of the implementation of the Salmon proposals and only 4% had been assimilated after the implementation of the scheme in their hospital.

In terms of age groups the largest proportion of nursing officers in any category was 24% in the 35-39 years age range. More nursing officers were in the older age ranges in psychiatry than in any other specialty partly attributable to the proportion of men working in this field. The time spent as charge nurses was significantly less for psychiatric nursing officers than others. The overall average was 10.5 years, the longest time being spent by the "specialist" nursing officers who had the least experience in previous administrative work.

Every nursing officer had a basic nursing qualification and all but 9 had a post-basic certificate. The average number of nursing qualifications per person was 2.5 and there was no difference in the number of qualifications when tabulated by age, hospital group or specialty.

2 The opinion survey

In respect of motivation for taking a post significant differences were found between the male and female nursing officers in that 11 of the 17 males and only 15 of the 83 females gave career orientated reasons. Two-thirds of both males and females however said they would consider taking a senior nursing officer's post.

The favourite part of the job for a majority of nursing officers related to the clinical or patient care work and some indicated that more clinical responsibility should be given to them.

In terms of the Salmon Committee's proposals, 70% considered that there were more advantages than disadvantages, and specific advantages mentioned included more clearly defined areas of responsibility, better knowledge of staff by nursing administrators, improved communication between wards and administration and a better career ladder. The most commonly mentioned disadvantage was a top heavy administration.

In general the opinion survey showed that strong criticism was not levelled at any single subject discussed and those who disapproved of certain things were not consistently critical.

3 Descriptive information about the nursing officers

Information on tasks performed and the work situation was obtained from both interview and continuous observation data. A random sample of 50 nursing officers was chosen from the 100 interviewees and a total observation period of 413 hours was obtained and records of these observations broadly categorised using the definitions of professional, administration and personnel work which were supplied in the Salmon Report.

(a) Professional activities

37% of the total observed time was spent on professional activities and of this two-thirds was occupied in gathering information and discussing patient care and conditions. Most of the remaining time on professional activities was spent on nursing patients, teaching, giving information or attending meetings. Included in the two-thirds was the time spent in ward rounds, usually consisting of a tour of the ward and short conversations with patients. In total these rounds took between a quarter and a third of the time spent on professional activities. Teaching took only 3% of the time which was observed in the professional work area.

(b) Administrative activities

20% of the total observed time was spent on administration. The psychiatric nursing officers spent the greatest proportion of time on this work (27%) and the maternity nursing officers the least (9%).

One-third of the total work time in this category involved writing letters and reports, organising work and compiling staff duty rotas. Discussing policy took one-fifth and most of the remainder (a little less than a half) was occupied by organising work either for other nursing staff, ancillary departments or for the nursing officers themselves.

(c) Allocation activities

Allocation activities were analysed separately since it was considered important in the light of computerisation on this subject. These activities took 10% of the total working period. A decided majority of the nursing officers undertook this work and some had considered it to be the most important function that they performed. Half of the activities entailed an assessment of the nursing needs of a section and of the competency of the staff required, and included answering requests from section staff for more staff dealing with coverage, compiling and changing rotas and deployment of staff.

(d) Personnel work activities

Personnel work taking 15% of the total observed time involved activities in which nursing officers were helping staff or being in a learning situation themselves. Talking informally to staff when conversation was on topics apparently unrelated to work took almost one-third of the time in this area.

(e) Other activities

The remaining observed time was taken up in clerical (9%) and transit (9%) activities. In the former the most time-consuming tasks were copying out lists and filling in pay sheets.

In conclusion Miss Wilson-Barnett noted that the results of her study only indicated the trend of development of the work of the nursing officer. The findings indicated that many tasks were performed by a majority of the nursing officers and that detailed information seeking occupied most of the time spent on professional work, and usually much less time was spent on direct patient care functions. The suggestion that nursing officers might usurp the charge nurse's professional role was not supported by the findings.

Ideologies of nursing - their meanings and implications

MISS KATHERINE WILLIAMS, Research Fellow, Department of Sociology, University of Aberdeen, explained that her paper dealt with the meanings and significance of two dominant nursing ideologies - Vocation and Profession - for the relationships between doctors and nurses, for some of the tasks that nurses performed and for those aspects of a person's illness that threatened his adult status by creating conditions of helplessness. A sick person's helplessness lay at the centre of those tasks which were embodied in the image of 'the bedside nurse'. The surrender of these tasks was the subject of debate in nursing and many nurses wished to shed them and the image that embodied them even claiming that nursing now had nothing to do with hospitals. However, it was primarily through service in hospital that a nurse was admitted to this title and confrontation with adult helplessness continued to be a major element of her hospital work.

In the 19th century, as now, doctors had a monopoly of the knowledge relating to disease and its treatment and nurses' work was regarded as being in service to this knowledge; and then, as now, this servile role of nursing in relation to medicine partly constituted the existential problems with which doctors and nurses attempted to deal. The concept of the nurse fulfiling a servile role was therefore consolidated and adjusted to psychologically. The ideology of Vocation was adjusted to those tasks of nursing that related to a sick adult's helplessness and which might entail washing, feeding and cleaning, tasks that an adult normally performed independently and in privacy. Such tasks might be physically repugnant to both nurse and sick adult. To deal with this situation as a vocation however retrieved the status of the nurse performing the tasks as well as the status of the adult for whom they were performed. The adult status of the sick person was retrieved through the fact that any task performed for him was regarded by the nurse as her privilege for throughout it she found the satisfaction and fulfilment of her calling. Also, though in helplessness the patient may have lost his independence, his worth as a person was increased by the nurse's dedication to tasks performed in willing service to that helplessness.

Bedside nursing was a complex compound of actions and tasks performed in a context of social relations, and the evaluation of these tasks also entailed an evaluation of persons (doctors, nurses, sick people etc) and their status relative to one another. The inter-relationships of these factors were subject to continuing change and in relation to nursing tasks could be

illustrated by the use of the thermometer. In the 19th century, when fever was an important criterion of disease, it was used only by a doctor. In the 20th century the thermometer might be used by a nursing auxiliary since fever had long been supplanted for doctors by other criteria of illness. In the same context nurses had become involved in the work of monitoring complex machinery or carrying out difficult clinical procedures and observations in comparison to which the tasks of feeding and washing sick persons might be regarded as a waste of skilled time.

These newer attributes of nursing were embodied in the ideology of Profession. When analysed in a specific context of usage it was seen as a claim for equality between nurses and doctors. The recent report of the Royal College of Nursing to the Briggs Committee asserted that "nursing was not anciliary to medicine but complementary to it". The claim to be a Profession thus importantly involved the break of the traditional relationship between doctors and nurses.

Where a 'professional' nurse's work focused on clinical procedures and observations then helplessness as a condition of an adult human being might become categorised, and even lose itself as a human condition, through the emphasised use of clinical terms and clinically orientated judgments and behaviours on the part of the nurse. Actions and judgments were therefore based on mainly clinical definitions of illness: for instance what was of importance were reactions of the pupil of the eye to light; the state of corneal tissue; reflexivity of muscle and the level of blood pressure and its control by drugs. When the helplessness of a sick adult passed from the stage of clinical crisis and clinical categorisation, however, it passed also from the care of the nurse who was regarded as 'professional'. Feeding now became part of the normal ward routine and was not regarded as a task of 'professional' bedside nursing, seen as a focus of valuable skills. It was at this point that adult helplessness, so far cared for and defined by the clinically orientated 'professional' nurse, was surrendered to other groups. The sick adult, recovered from his acutely ill state, had to surrender himself to his attendants. The tasks relating to his helplessness were now performed for him not by the 'professional' nurse but by groups whose ideologies were still unsystematised.

An ideology of Profession was therefore an aspect of the surrender of fundamental nursing tasks whose evaluation carried important consequences not only for the relative status of doctors and nurses but also for the status of the sick person. The problem of conflicting definitions and evaluations of tasks relating to helplessness however was increased when nurses claimed autonomous control of the direction of nursing care. For their definitions of adulthood might not coincide with those of doctors and conflicted further when both nurses and doctors claimed as 'professionals' the right to control their own work. While the nursing definitions of the sick person in their clinical emphasis followed closely the medical definitions, the social behaviours of a sick person were given incompatible definitions by doctors and nurses. For a doctor the recovery of a helpless adult was the description of the recovery of physiological functioning. In the daily record of the sick person kept by nurses, behaviours of helplessness were seen to move from the categories of clinical observation to arbitrary stereotyping of behaviour such as 'bell-happy'.

The problems of bedside nursing involved the evaluation of tasks and the evaluation of the relationship of the bedside nurse to both the sick person and the doctor. Ideologies of nursing supplied a part of this evaluation in a way that affected nurse, doctor, sick person and tasks. The issue of whether these ideologies could ever be fruitfully discussed as problems of "the status of nursing in relation to medicine and other occupations" needed to be raised. What was probably at issue was the meaning of work and of the actual social context in which it was performed.

Scottish Hospital Centre
October 1972

Comprehensive health planning

Meeting at the Scottish Hospital Centre on Friday 10 November 1972

The deployment of scarce and expensive health resources must be based on some rational expectation of need and of benefit not only at the planning stage but, so far as could be foreseen, for the economic life of the investment. At this conference the establishment of health care programmes within an integrated health service was discussed and recent developments in certain new town areas were outlined.

SIR JOHN BROTHERSTON took the Chair

MR K BARNARD, Research Officer, Health Services Planning, The Hospital Centre, London, noted that under the English White Paper which suggested the organisational framework for the National Health Service after 1974 all branches of the NHS would be brought within a unified administrative structure. Two statutory levels would be established. In addition to the Central Department there would be Regional Health Authorities (RHAs) and Area Health Authorities (AHAs), the latter coterminous with the new local authority District Councils. In addition, family practitioner services would be administered by a statutory committee of the AHA - a family practitioner committee (FPC), and statutory professional advisory machinery to RHAs, AHAs and FPCs would be established. Community health councils would also be established which would separate management and community representation to encourage constructive interplay of ideas. They would include a wide cross section of opinion with some 20 - 30 members, half appointed by District Councils, and would be required to publish an annual report.

The Secretary of State would announce his decisions on the proposed organisation structures and management processes for the new authorities after formal consultation with the interests concerned but, as recommended in the report on the management study of the NHS in England and Wales, the general aim would likely provide for a fully integrated local health service by -

1 co-ordinating all health services with each other and with local authority services

2 planning services in relation to needs

3 enabling doctors and dentists to contribute to decision making

4 achieving more uniform national standards of care

5 encouraging innovation and improved approaches to care

6 ensuring skilled staff were used effectively, and establishing clear flexible career structures and education and training programmes

The proposals reflected six key features essential to an effective NHS organisation - integration at 'district' level, participation by clinicians in management, co-ordination by multi-disciplinary management teams, clear allocation of authority and accountability, decentralisation balanced with strategic direction, and flexibility of arrangements.

MR J STRINGER, Director, Institute for Operational Research, indicated that in essence planning took place in the belief that the future would be worse if it was not undertaken and better if it was. But 'better' and 'worse' were matters of opinion on which the future might have different ideas from those held today. The question of objectives often seemed to be avoided but one criteria for a satisfactory planning process must be that, to the extent that it was technically and politically feasible to do so, the planning process should seek to establish clear objectives and to provide the means by which they could be pursued. Within any planning process a degree of conflict had to be recognised. It would be undesirable as well as impossible to decide every aspect of the future so decisions about the future ought wherever possible to be made in the future. Since however one could not avoid affecting the future by actions to be taken now one looked to planning to preserve a freedom of choice and to avoid if possible the sort of crisis problem which, when it occurred was too late to be solved. It followed therefore that planning should try by actions taken now to make it possible to attain whatever in the future was considered desirable, and to provide for objectives to change and enlarge as time went by.

Essentially one was dealing with an open system, planning being a continuous process and not something of which the end point was a plan - a system whereby ideas led to decisions, to action, to effects and again to ideas was going on all the time on different time scales. A plan gave a map of decisions which might be faced with and permitted one to look at them all together. Everyone involved in the field participated and the process was not one undertaken exclusively by the 'planners'.

It was useful to analyse factors which could cause difficulty in arriving at a choice between two or more postulated courses of action. Difficulty only existed when there was uncertainty since if everything was known with complete certainty no problem of choice would remain. Uncertainty could be considered in three distinct categories -

Uncertainties about the environment

When uncertainties were perceived about the situations that planning was intended to influence, this often led to demands for more information surveys, analyses; in short to research;

Uncertainties as to appropriate values

The existence of these uncertainties was reflected in demands for clarification of the policies, goals and objectives, and perhaps a realisation of the need for wider participation in the decision-making in the attempt to ensure that 'correct' or 'representative' values were incorporated in decisions;

Uncertainties about intentions in related areas of choice

When uncertainties were recognised as due to the fact that other planning decisions had not been made yet, or not revealed by the responsible agencies, this usually led to demands for more co-ordination or a more comprehensive planning framework.

Recognition of the fact that there was a great deal of uncertainty therefore concerning the effects of changes in a health service suggested a third criterion for a successful planning process, viz that it should systematically identify major sources of uncertainty and attempt to deploy the available planning resources in such a way as to reduce this uncertainty as far as possible.

In terms of planning the health services for an area the amount of data that might be collected about the present situation was formidable and this fact alone made it difficult to do more than try to solve problems as they appeared. Planning however was for the future and the more sophisticated types of planning all required some form of prediction of future opportunities and problems in the form of a reference projection (stage 1). This might be defined as a forecast made on the assumption that present trends and policies would continue without change. It would need at the minimum to take account of changing numbers and age structure in the population; recruitment and wastage of health service personnel; hospital and health centre developments on which commitments had already been made; and national morbidity trends. The purpose of the reference projection was diagnostic and did not of itself decide anything.

At the next stage however value judgement was implicit in the selection of those gaps and shortcomings that were to receive planning attention - appreciation of the situation (stage 2). In principle this stage was that at which the picture of the unmodified future emerging from the reference projection was compared with a picture of a more ideal future in order to identify those shortcomings about which action might be desirable.

The appreciation logically proceeded assembly of a range of ideas for tackling the problems that had been identified (stage 3). Some of these ideas would require capital developments, others involved changes in staff, changes in operational policy, or the restructuring of existing arrangements. In practice the range of options considered would be limited in various ways, eg what can you ask a doctor/nurse to do?

The next stage for consideration in the planning process related to the effects of options (stage 4). The effects on health of the allocation of resources and other kinds of decision open to an area authority were indirect. They took effect via individual clinical decisions about treatment or referral elsewhere as well as behavioural decisions. Another source of uncertainty concerned the outcome of alternative methods of examination or treatment.

Ideas for change could not be appraised as isolated individuals and thus there was a need in the planning process for a stage of synthesis of feasible answers (stage 5) in which ideas were brought together in acceptable 'portfolios'. In the formal assessment (stage 6) the small number of definitive proposals which had been arrived at by the planners to meet the objectives agreed upon at the appreciation stage would be examined more widely involving consultations both locally and with the centre. In stage 7 one was concerned with the formal and irrevocable commitments which the area authority itself made. The concept of a 'robust' decision was arrived at and the choice of a set of actions decided on in such a way as to maximise the scope for adaptation to future changes in circumstances of objectives.

Action to implement changes (stage 8) called for the design of management controls both to measure and evaluate the outcomes of planning decisions and to ensure that the intentions behind these decisions were being followed.

Concluding Mr Stringer noted that the organisation of the planning process should provide for the post evaluation of all major projects and other innovations but since the object of this was to contribute to the general body of knowledge it could be considered to be a central rather than an area function.

DR D G GOODING, Principal Medical Officer, Buckinghamshire County Council, described the comprehensive health planning arrangements in relation to Milton Keynes new town. Milton Keynes, which was situated approximately half way between London and Birmingham, was the largest projected new town in the UK at present with a target population of 250,000. Planning of the new town was at present well developed as a multi-focal city based on a kilometer grade network of roads. There were well defined catchment areas for health centres, a large central site available for the provision of a district general hospital, an existing college of further education and the Open University. The existing area, which had been designated some 4 years ago, consisted of 3 small towns and 12 villages comprising a total population of 45,000. Within that area (35 sq miles) the existing medical services included 22 general practitioners in 8 group practices (3 in new premises), 16 general practitioner dentists and a sufficiently large number of pharmacists to meet the requirements of the first 10 years' development. In terms of hospital provision there were 2 out-patient units and 2 general practitioner maternity units but otherwise hospital requirements were met by the units approximately 20 miles distant at Northampton and Aylesbury. It was in this context, therefore, that a medical planning group was established in 1968 to draw up the overall objectives for health service development in the area. The group, having examined the various trends in the service, selected those which they wished to develop in the context of a community orientated service with hospital specialist back up. The aims were to provide the maximum number of services from within the community by making adequate provision for health centres and other community based facilities.

It was envisaged that the health centres, which would be staffed by 12 - 15 doctors with the same number of nurses and ancillary staff, would each serve approximately 30,000 and the general practitioners would be free to follow up any special interests which they might have. The consultant out-patient services in the health centres would be arranged in community orientated specialties of psychiatry, paediatrics, geriatrics and the care of the handicapped.

In planning for the implementation of integration of the service within the area, a health service liaison committee was established as a policy making body with member as well as officer representation from the three branches of the health service and representation from the development corporation.

Health centre developments had been planned in five areas. Each would have a different orientation, one on the hospital campus, associated with in the first instance a 100 bed general practitioner community hospital (due to start early next year) which would act as a focus for both under-graduate and post-graduate teaching; one on a large secondary school campus associated with child guidance clinics and acting as a centre for school health services in the area; and one in the centre of the older towns, etc. Due to strong public opinion on the desirable location of the first health centre however and an unwillingness of two adjacent but sociological different towns to share one centre, it had been necessary to reach a compromise decision whereby two smaller centres would be built to serve the areas involved.

Points of particular interest in the proposed health services included the provision of general practitioner dentistry in health centres on an experimental basis, an increasing orientation towards ethical pharmacy with facilities located adjacent to health centres, a general lack of interest on the part of ophthalmic opticians in any close association with

other parts of the health service, consideration of the establishment of an occupational health service on the basis of requests from the local authority, NHS statutory bodies, the Open University and industry, and arrangements for the collection of basic data from general practitioner records in association with the Oxford University community health project.

It was important in the future organisation of the planning processes to emphasise the importance of Milton Keynes becoming a district with at least a shadow authority in 1974 (even though at that time it would not have its own district general hospital) so as not to stifle initiative and overshadow Milton Keynes' planning with existing problems in Aylesbury. There were considerable advantages in the proleptic appointment of consultant staff, their involvement with existing general practitioners in working groups and the possible adaption of these groups to health care planning teams.

DR A H DUNCAN, Principal Medical Adviser, Health Services Joint Advisory Committee for the Livingston area spoke on area health planning in relation to Livingston New Town. He remarked that the development of the health services in the designated area of the new town - largely an undeveloped agricultural one with a district hospital nearby - had taken place with the objective of establishing a fully integrated health service. To achieve the objects a general strategy had to be developed based on individuals working in the health service and their roles. Initiative for the establishment of the scheme had come from the central department and in 1966 a Joint Advisory Committee had been set up with an advisory role within the existing statutory framework. Four target areas for development were established:-

1 an expansion of the role of the general practitioner with special interests

2 development of preventive medicine and health education in the remit of the general practitioner

3 developments in the role and relationships of the hospital staff in relation to the community

4 the organisational aspects of establishing the service.

Each general practitioner was limited to 1,500 patients on his list, and undertook a specialist role relating to in-patients or out-patients or within the health centre. In preventive medicine, programmes had been developed in such areas as cervical cytology and family planning and as an effective monitoring process was desirable in this area a computer assisted record system had been developed.

The hospital consultant was seen as fulfilling three distinctive roles. Attendance at out-patient clinics within the health centre was seen as a major factor in maintaining good relations within the community health team; he fulfilled a significant role by providing post-graduate education in his particular specialty and probably most important he was the pace setter, organiser and stimulator of developments in the specialised aspects of the service.

In terms of organisation a vocational training scheme lasting three years had been established whereby the general practitioner spent one year in a specialty, one year in practice, six months in general medicine and six months in another field as appropriate. It was the aim of the scheme

that doctors who were recruited should have usually graduated for at least two years but in effect those recruited to the scheme had had more experience. Work was organised on the basis that doctors working in a specialty pursued their activities free from community work and the six general practitioners within the scheme were organised on the basis of three teams of two.

The objects of the activity were pursued on a community health team basis. The development of the new role for the family doctor meant new activities for other professions working alongside also. A system of direct approach to any member of the team was adopted whether it be relating to nursing, social work, physiotherapy, dietetics etc staff.

Within the Livingston framework although there was an undoubted opportunity to develop the role of the nurse within a community health framework, Dr Duncan indicated that 'rigidity' in the nursing hierarchy tended to inhibit the optimum exploitation of the nursing situation. The recent report on nurses in an integrated service had however suggested a new role and new extra training for the nursing profession in the community field and there was considerable scope for the skills of the district nurse, health visitor and district midwife to be welded together in the community nurse. There was a great opportunity within the existing situation for experimentation in the field of nursing care and it would be most unfortunate if this were not fully taken advantage of.

In conclusion Dr Duncan noted that support for the scheme by the various authorities concerned had been most encouraging and it could now be said that various elements of the joint project were already proving successful including the introduction of the concept of the GP/specialist, the development of the vocational training scheme which had attracted a high quality of recruits, and the introduction of a computer assisted medical records system, although much still remained to be developed in this latter case. There had been a significant change in the attitude of the hospital consultant staff to the general acceptance of the project and in this direction it was significant to note there was at present a waiting list in some specialties for medical assistant posts.

DR T F M JACKSON, Medical Officer of Health, East Kilbride, described the background to the organisation of health care in East Kilbride, the first of the Scottish new towns and currently the eighth largest town in Scotland.

It was necessary to develop as comprehensive a range of local authority support services as time and money would permit and the forging of links with other branches of the National Health Service. Discussions took place on existing health problems, how to improve services and the introduction of new ones, the collective purpose being to liaise as closely as possible in an endeavour to provide an efficient system of community health care. Since 1968 in addition to the usual services, four community centres were adapted as clinics and developments took place including the provision of family planning facilities, attachments to group practice, a pre-school centre for physically handicapped children, well woman clinics, a day or evening sitter service, home dialysis, domiciliary physiotherapy, nursing services for the chronic sick etc. During 1971 erection of a major health centre got under way and a clinic physiotherapy service was started.

In an endeavour to provide better all round co-operation in patient care, better understanding between GP and local health authority workers and increased contact with social services, attachment in depth had been provided for all nine group practices (33 doctors) and for the two single handed practitioners in the town. Such attachment involved the local district hospital at Hairmyres, Bellshill Maternity Hospital and Coathill Geriatric Hospital, Coatbridge. Schemes of attachment however meant more work for those concerned and the development of community care would increase the workload of the nursing profession. There was need for a day or night nursing service for certain categories of patients whose relatives might manage at home given relief. Sitter services were similarly required to provide respite for parents of handicapped children and others caring for sick or elderly relatives.

In terms of participation by general practitioners the strategy adopted had been to set up certain services, operate them initially using local authorities medical and nursing staff and then invite general practitioners to participate. In child health for example case cards for the screening of entrants had been introduced into all child health clinics in East Kilbride. Subsequently attempts were made to interest each group practice in carrying out developmental paediatrics sessions and at present six practices were doing so, family doctors and local authority medical officers using identical case cards. At the other end of the age spectrum family doctors and consultants were engaged in a community health service for the elderly. The average age in East Kilbride was just under 30 years and in a matter of 35 years there would be large numbers of individuals concurrently requiring medical and social services. The numbers of the elderly were well below the national average and manageable at present and so it appeared prudent to explore the possibility of developing an integrated community health service for them which would be capable of expansion year by year. Built into this service was an operational research element which had three objectives:-

1 to screen the elderly population, ie those of 65 years and over for overt or latent disease or social problems requiring attention

2 to assess the effectiveness of an integrated community health approach to meeting such needs

3 from the data obtained to attempt to forecast what services might require to be developed in the future

Even at this early stage there was evidence of the benefits deriving from close links between all three branches of the health service and the social work field in providing community health care for the elderly.

Hospital consultants as well as assisting in the running of a number of the community services in East Kilbride also helped to staff the anti-smoking clinic and formed a resident team of lecturers. Psychiatrists from Hartwood Hospital also held out-patient sessions and a consultant ophthalmologist saw patients referred via the community health service for the elderly.

Looking towards re-organisation, a district of a health board was likely to be served by a range of primary care facilities based on health centres or group practice premises backed by a district general hospital. Such services would require to be closely related to social work departments and the sanitary inspectorate and with present and future local authorities. In terms of the various services available in East Kilbride many of the prerequisites for the health service of a district were

already available. These included:-

1 a district hospital at Hairmyres (614 beds)

2 a health centre for 20,000 of the population with a major centre catering for 35,000 soon to be opened. In addition three further satellite centres were at the planning stage

3 a day centre cum day hospital would soon be under construction where the healthy elderly would be joined by the frail ambulant elderly

4 a functioning executive group principle

5 the vast majority of primary care teams were either functioning in or were about to practice from health centres

6 the nursing service was geared to continuity of care

7 certain local authority services had now been largely taken over by family doctors

8 hospital consultants acted as advisors or actively participated in certain services

9 if a divisional system of clinical organisations were introduced the specialties of child health, geriatrics and mental health already involved health centres and clinics, and GPs and local authority staff were also participating in such services

10 some social workers in the town were attached to group practices

11 the team approach adopted with the health department in communicable disease problems was indicative of co-operation on all sides

12 the Town Council had funded many of the services which had been provided; such a progressive attitude by the elected representatives was unlikely to change after 1974 or indeed 1975 when the town became a new local authority district in its own right.

DR I M MACGREGOR, Principal Medical Officer, Scottish Home and Health Department, considered the need for continuous health planning was as obvious as the process was difficult. The deployment of scarce and expensive health resources must be based on some rational expectation of need and of benefit not only at the planning stage but so far as could be foreseen for the economic life of the investment. The problems confronting the health planner related largely to the confidence and accuracy of his predictions and the ability of the organisation to provide the resources in the right form in the right place at the right time.

The health planning activity could be viewed from two separate but interdependent angles - the development of professional services and resources; and the capital investment programme. Ideally the timetable should ensure that the provision of the service and building requirements would synchronise and that entire projects would emerge as complete functional units. This however was not always achieved.

In making planning assumptions one had the benefit of some hard data of a highly reliable nature - crude population projections fell into this category when they were not specifically related to development or redevelopment areas. One also had the benefit of informed consensus opinion in official and other documents, reports of working parties or the results of studies of many operational situations which seemed relevant

to the plan. But one had to guard against a straight projection of the traditional into the future. There was an abundance of firmly held personal beliefs which had to be taken into account - and perhaps even accepted as part of the plan so as to make progress in spite of the fact that these ran counter to the general views. The health centre building programme in Scotland was a good example of this. Uncertainties which ranged from simple organisational to sophisticated clinical and other problems had to be given weight in the planning process and were powerful incentives to flexible planning. Perhaps the most frustrating part of the health planner's task was his inability to predict the resource requirements and the functional impact of new techniques or ideas which had not yet passed beyond the development stage or still required evaluation in cost benefit terms. Examples of the former were communications, recording and evaluation systems and of the latter, programmes of health screening.

Dr Macgregor then turned to illustrate a few of the uncertainties which existed in some very narrow areas of evaluation, interpretation and projection. Clinical performance was notoriously difficult to measure but a few simple observations revealed unaccountable variations in certain aspects of practice by Scottish consultants in situations which would be expected to show a high degree of comparability. These included the duration of stay in hospital, where in general medical wards the treatment of peptic ulcer varied from 8 - 32 days; in general surgery for the same diagnosis 6 - 26 days; and again in general medicine for the treatment of myocardial infarction 10 - 36 days. Such figures were concerned with the management of clinical resources - but they must also be a reflection of clinical judgement and attitude. They clearly supported a need for further enquiry into the causes of such substantial inconsistency and provided a warning against their use as a measure of output of clinical satisfaction or success. They also underlined the very considerable changes which could occur in the demand for services in the future within the observed range of difference.

Other uncertainties were illustrated in relation to orthopaedic surgery, bed complements, waiting lists and bed usage in different areas; and in relation to the range of provision and performance of 14 medical units. Having estimated the performance which one would expect from units operating at the higher levels of functional efficiency one could apply these values to the system or any part of it as the basis of planning a new hospital.

Having decided on the functional content in terms of acute medicine, surgery, orthopaedics, paediatrics etc the bed complement of each discipline was calculated using an accepted formula and then consideration was given to the "other factors" to determine the final bed content. These included:-

1 trends - indicating changes in pressure - waiting times

2 excessive provision - even a reduction of 10% in bed complement still left further opportunity for retraction

3 new technical developments

4 organisational changes in the professional and administrative structure - linked with service pattern. This related to the development of stronger ambulatory care services and the movement of some traditional hospital activities into the health centre field

5 building design, the standard ward unit of 72 beds imposing some restraint on the final provision.

In determining the distribution of resources for the "smaller" specialties a larger catchment area was usually required and adjacent district hospitals had to be linked in order to justify a viable in-patient provision. Dr Macgregor in conclusion noted that there was a need for further and more intensive study. He did not believe that the fact that Scotland was within sight of the completion of the planning stage of the district general hospital building programme was any justification for restraint in operational research or the study of improved management techniques by the clinicians.

MR W P LAWRIE, Assistant Secretary, Scottish Home and Health Department, spoke briefly about the existing organisation within which health planning was done in Scotland. He stressed however that although the pattern of the future organisation and working arrangements was becoming firmer, a lot of detail had still to be settled and it was of course possible that some of this would evolve after the main structure had been set up rather than be established beforehand.

There were under the present arrangements three separate authorities - Local Health Authorities, Executive Councils and Regional Hospital Boards /Boards of Management - plus the Scottish Home and Health Department with the role of co-ordinator in so far as this could effectively be exercised and the Scottish Health Services Council formulating advice on various matters - mainly clinical. Each authority had its own priorities to be determined within the limited resources and therefore it was extremely difficult to get all three executive authorities to come to decisions on the provision of resources in step with each other so that a co-ordinated development could take place. One also had to bear in mind the university involvement where there were teaching implications in any development.

Despite the establishment of various joint advisory committees, for instance in new town developments, these bodies could only function in an advisory capacity and could not commit the individual authorities they represented. The only point at which all three authorities came together was in the Department and even here the influence which the Department could exercise through finance (which was the major stumbling block at all times) was minimal in relation to local health authority services which comprised one part only of the wide range of local authority functions which received substantial support from the Exchequer through rate support grants. Similarly it had been the Department's policy to leave the hospital authorities with as much freedom as possible so that there could be little or no interference with the determination of priorities by the hospital authorities.

There were of course other difficulties in the field which had nothing to do with the existence of three separate responsible authorities, eg the status of general practitioners as independent contractors and the differences in the system of remuneration between doctors and dentists.

Nevertheless there had been some notable successes, in particular the Livingston experiment, the developments at East Kilbride and, on a smaller scale, the integration of the community and general practitioner services with the hospital services in Stranraer. The basic lesson to be learned from the experience of the existing administrative structure

was that it made co-ordination and integration extremely difficult and certainly it did nothing to facilitate it.

In terms of the future organisation and how this should facilitate comprehensive planning of health services, the Department and the Health Boards would be involved in the formulation of policy by their participation in the Planning Council as members. The Planning Council would have a wider role than the existing Scottish Health Services Council because it was envisaged that it would consider the distribution of resources (money and manpower) as well as the organisation of health care so that a new co-operative function would come into play. Recommendations on broad policy would therefore be made by the Planning Council to the Secretary of State who would be able either to accept or amend the recommendations and promulgate them to Health Boards or to reject them. Health Boards would therefore be responsible for planning the organisation of services in their areas within the broad outline determined by the Secretary of State.

It was important to appreciate that it was the Health Boards' part in the planning process which was likely to attract most attention because it would be the results of Health Board decisions which would be evident to patients and the community in the quality of the service available to them. The critical point in the structure would therefore still be at the same level as at present, eg the Regional Hospital Board; it would however be spread over a different number of authorities but each would have a broader range of services to organise and would be making decisions affecting all these services, not only one as in the past.

It was worth considering however the different scope which would exist for planning in each of the services and the extent to which they could interact within a Health Board's decision-making process. In terms of pharmaceutical, dental and ophthalmic services for instance the Health Boards would not have any direct power to plan and organise the services and the scope for changes in organisation would be limited. The organisation of community and hospital services however was much more susceptible to local and national planning decisions and these were the fields in which Health Boards would have greatest scope in determining how services should be organised. It followed therefore that if the planning function was really to be effective at Health Board level, Boards should have a fairly wide freedom of decision in the use of the resources available for this range of services. If at all possible therefore the system of budgetary control should enable Health Boards to formulate their area policy on a comprehensive basis and not to be constrained by separate budgets for separate parts of the Service.

Probably the most controversial area was that relating to the general medical services. In the past these had not been susceptible to the same kind of planning decisions as the community and hospital services and the distribution of doctors had been the main concern of Executive Councils, not how the services should be organised. If general practitioners were in the future to become involved in hospital work and were to be part-time members of hospital staff as well as family doctors, and, if the Health Boards were to be in a position to decide how they deployed the medical manpower resources available to them, then it followed that the Boards should be able to consider both elements of medical staffing together and decide on, having taken professional advice, the extent to which in each area general practitioners should be concerned with family doctor services and with hospital work.

DISCUSSION

In the course of the discussion session the following were the main points to emerge:-

1 Area developments

There were undoubted advantages in terms of developing a comprehensive health care service for this to be undertaken in an area, such as a new town with a captive population, where no previous pattern of service was in existence which might inhibit the introduction and organisation of new health services. However in established urban areas where a scatter of population, depending on the participating general practitioners, might be expected to attend health centres it was possible that greater difficulties would be encountered in organising a comprehensive health programme.

2 District and area boundaries

The existing four university medical teaching centres, with their associated high level of specialisation and research activity, would, as at present continue to provide certain services on an area or even national basis within the restructured service. It was stressed in this connection that district boundaries should not be regarded in any way as clinical boundaries and certain functions and organisations were likely to extend over different districts and areas. The suggestion was made that there might be a place for functional districts within areas, eg in geriatrics, child health etc but it was emphasised that numbers, as could be readily identified in a fixed geographical district, were important in pursuing certain policies relative to the provision of health care.

3 Estimates of future needs

It was noted that although estimates of future requirements, eg in relation to bed numbers, could be projected by the use of existing data and accepted formulas, the figure arrived at could only be regarded as a guide (albeit as accurately arrived at as possible) to anticipated requirements and might need adaptation in practice when needs were firmly identified. Architectural flexibility in relation to hospital design was clearly relevant in this connection. The health service planner could therefore only provide a framework on which the service could be run and it was important that each health service agency should be left to determine priorities and deploy the resources within their authority as they considered appropriate in the light of day to day requirements.

4 Multi-disciplinary involvement

Discussions by multi-disciplinary groups were most valuable in the stimulation and development of ideas in connection with health service planning. Innovations could come not just from the centre but could be suggested from any of the various staffing levels in the health services and it was important to have a management system which would enable new ideas to be channeled for consideration by the appropriate body. In England the health planning teams performed a vital role in this direction and, by its members usually being also involved in the day to day running of the service and attached to various other health bodies, maintained a close link

with the thinking in different branches of the service. In any context the importance of providing the optimum situation for the 'sparking' of ideas was stressed and also of ensuring the timeous transfer of planning theories into practice.

5 Evaluation

In considering the development of any branch of the Health Services it was most essential that a close examination of existing practices relating to the various professions should be made. Although what was planned should of course be designed to meet the requirements of the services to be provided, the planning processes should include a careful evaluation of how these services were performed by the professional staff themselves. By ensuring such self examination within the professions, improvements and developments in terms of standard and quality of health care could be established to the benefit of the individual served within the community.

6 Involvement of public

There had in the past been little effort on the part of the health services to enter into direct discussions with the public on the planning and organisation of services within particular areas. Reference to public opinion had been taken by way of the views of Board and Committee members and in general this was considered the most satisfactory arrangement since, with a limited knowledge of the factors involved, the general public tended to evaluate the facilities provided on the basis of convenience without regard to financial limitations and overall service requirements.

Scottish Hospital Centre
November 1972

Neo-natal information services

Meeting at the Scottish Hospital Centre on Friday 23 February 1973

At this conference experience of the neo-natal information services available in Scotland and of the likely development of such systems in the near future were appraised by a group representative of those concerned with the care of mothers and infants and with the preparation, handling and interpretation of data.

SIR JOHN BROTHERSTON took the Chair

DR I W KEMP, Medical Officer, Scottish Home and Health Department, in opening the conference examined some sources of information about health of children in Scotland and the service they received and indicated areas where information was lacking or where difficulty existed in actually extracting information. The problem was not merely to ascertain sources of paediatric information, of which there were many, but to find those sources where there also existed a balanced view of health problems of the rest of the population.

The primary source of information was the General Practitioner who, if asked at which age patients caused him the greatest worry and difficulty with regard to diagnosis, management of illness, unexpected difficulties necessitating admission to hospital, and even unexpected deaths, would probably suggest children and especially those under the age of one year. The GP as a source of information, however, was not likely to be in possession of many facts and figures beyond the confines of his own practice - communicable and verifiable data from which decisions could be taken.

The Medical Officer of Health on the other hand was a repository of certain data covering a complete population and he had means of communicating the information in a variety of ways such as by his annual report. Information might be grouped into that relating to the health of the community - by its vital and mortality statistics: and morbidity statistics; and on the services which he provided to meet the health needs of the community.

Another major source of information giving a balanced view of paediatric information in relation to the rest of the community was the Registrar General who collected data covering the field of vital and mortality statistics.

Local Health Authorities also collected national data covering such services as health visiting and children's clinics, and some school health data recorded locally was transmitted for central government analysis, for instance information on handicapped children and on data immunisation.

Hospital based information including children discharged was recorded on form SMR1 and increasing use was being made of this type of information at local level. The use made of hospital services by specialty was recorded on form HS 10.

One of the primary sources of vital and mortality statistics was the demographic Year Book issued by the statistical office of the United Nations first published in 1948. In association with this the W.H.O. printed several publications - in particular the World Health Statistics Annual containing detailed information on eg deaths by cause, age and sex.

The main method of use in the assessing of the health state of a population was in the comparing of one situation with another. Comparisons might be of time - present against the past; geographical - maybe international or national; socio-economic - social class differences, cause of morbidity or death or any combination of these factors. Of these however the comparison most frequently used was probably that of time. For instance it was usual for the MO'sH report to give mortality statistics for the current year compared with the previous year eg in relation to infant, neo-natal, post neo-natal, stillbirth, and peri-natal mortality rates. MOH reports however tended to differ between local health areas both in the content of material and method of its presentation and collecting comparable information from a number of local health authority reports was difficult, time consuming and sometimes impossible.

Information provided by the Registrar General covered vital and mortality data. From parish to national level comparisons could be made of geographical areas, time, social class and cause of death. Information for presentation was selected on the basis of various parameters which from experience were known to be favoured by central or local government, Universities and others. Sometimes however the data was not in the form required and they might then have to be extracted from tabulations already prepared, and this was time consuming. Alternatively they might only be on punch cards which were difficult to process especially if a large quantity of data had to be manipulated. Although a computer was being introduced, it would clearly be some time before ad hoc requests could readily be carried out.

In relation to international data there was value in comparing Scotland's position with other countries, but the difficulty lay in finding sufficient data to carry out comparisons. Some countries took longer than others to produce up-to-date information and data might not be kept in the form required for a particular study. Considerable effort was required to compile tables from this type of data.

In conclusion Dr Kemp suggested that what was required were standardised data covering all aspects of child health - morbidity and mortality - by a multitude of parameters of background. Such data should be collected in a standardised form and be easily manipulable to present the information in a large number of ways for local and central use.

DR J D DONNELLY, Medical Officer, Scottish Home and Health Department described the systematic collection of information on patients discharged from obstetrical units and aspects of the intelligence which could be derived from it in relation to the examination of the problems of perinatal mortality. Currently, although the birth rate was falling, there were about 90,000 births per annum in Scotland and some 3,300 available staffed maternity beds in consultant and general practitioner units. The per capita provision in terms of obstetric beds and consultant staffing was marginally higher than in England and Wales.

As a result of pilot studies in 1967/68 a national scheme of maternity data collection was established in 1969. The design of the data capture document was such to allow permanent inclusion of a copy in the case record as a summary of the episode of hospitalisation. It was considered that the data content represented the minimum amount of information ordinarily collected in centres of good practice and comprised data identifying patient and hospital unit, a socio-demographic profile of the patient, previous obstetric history and a summary of the events in the present pregnancy. In general the data was captured by medical records staff who abstracted and coded the prescribed information from medical case records. Any system of data collection had an inbuilt level of error and before analysing the data and the prime results it was necessary to ensure that this was not unacceptably high. Although a study of error levels was still in progress, two general impressions had already emerged. Firstly item specific error levels were low (1%) except for the recording of complications (7%). Secondly, where completed and lucid medical case records were maintained, clerical staff had little difficulty in abstracting information and coding it accurately. It was clearly a requirement of the medical profession to maintain good records.

Being assured that the data collected was sufficiently free of error to warrant analysis, a programme of routine and ad hoc analyses was developed and the resulting tabulations fed back to participating hospitals. By reference to a series of slides Dr Donnelly demonstrated that there were significant differences in patterns of care between hospital regions in Scotland in terms of ante-natal admission rates, Caesarean section and perinatal mortality rates in both consultant and general practitioner obstetric units. While in the past perinatal death rates had been regarded as an adequate index of quality of obstetric care, this was perhaps no longer so. Examination of secular trends in perinatal mortality in Scotland showed an asymptotic curve that might ostensibly be held to be satisfactory, although it was difficult to estimate the significance of random fluctuations from year to year. If however perinatal mortality rates of vulnerable groups were examined for instance in relation to infants born to mothers with a negative blood group, to infants of low birth weight and to infants of the highly parous mothers which had in the past been identified by Baird, Lowe and others, then significant differences between the experience of individual hospitals and between teaching and non-teaching hospitals could be demonstrated. Although the data was raw and had an inbuilt error level, nevertheless it could be concluded that there were areas of anomaly in experience which suggested that lessons learned many years before were not being applied with equal effect and which warranted further investigation.

It could not be stressed too much that at the present level of sophistication the function of statistics of this kind was not to provide instant answers but to assist in the formulation of questions that would not otherwise be raised. Of the more than 70 items of information on the maternity discharge record only three referred to the infant: the imbalance was clear and the information to shed light on the problem areas defined was absent. With this background therefore it was concluded that perinatal mortality in Scotland was a clear problem, that to define and help solve this a complex systematic collection of information on all neonates was necessary and that the data base so generated should be used as a sampling frame to mount a confidential enquiry into perinatal deaths analogous to the maternal death enquiry.

DR GILLIAN McILWAINE, Research Fellow, Glasgow Royal Maternity Hospital, spoke on the perinatal survey carried out in Glasgow and the problems encountered. The aim of the study was (i) to classify all perinatal deaths occurring in the City of Glasgow during 1970 with the aims of classifying the deaths by clinical cause using the Aberdeen classification, (ii) to identify women losing their babies, (iii) to determine the type of care they received and after analysis of the data (iv) to recommend changes in practice which might result in an improved perinatal outcome.

A five page coding sheet was drawn up including details of the mother's social class and previous obstetric history, information on her ante-natal care, complications during the ante-natal period and details of weight gain, etc. Data on labour and delivery and the treatment that the baby received in the paediatric department were also recorded along with post-mortem findings and the registered and clinical cause of death. The majority of births in Glasgow occurred in 10 maternity hospitals. During 1970 there were 16,500 births with a perinatal mortality rate of 26.2/1000. This included 913 domiciliary deliveries with a perinatal mortality rate of 37.2/1000. There were therefore records of 462 perinatal deaths in various places throughout the city. By using information recorded in the Glasgow Child Health Record Linkage System a print-out of perinatal deaths by hospital of delivery, date of birth, hospital number, mother's name etc was obtained.

The perinatal deaths were classified by clinical cause and then divided into two main groups - environmental and obstetrical. The former group which included deaths due to foetal deformity, antipartum haemorrhage and premature cause unknown group accounted for two thirds of the deaths. This group was influenced by the health and physique of the mother and her social conditions whereas the obstetrical group (which included deaths from toxaemia, trauma, maternal disease, rhesus incompatibility and mature cause unknown group), was more influenced by obstetric practice. The highest perinatal death rates occurred in the foetal deformity group (6.3/1000), premature cause unknown group (6.0/1000) and antipartum haemorrhage (5.2/1000). Fifty mature babies died giving a perinatal mortality rate of 3.0/1000 live and stillbirths. In domiciliary practice there were particularly high rates in the foetal deformity, premature and mature cause unknown groups. There was also a high perinatal mortality rate in primigravidae with illegitimate pregnancies, the main causes of death being due to premature cause unknown (14.9/1000), antepartum haemorrhage (8.7/1000) and toxaemia (5.0/1000).

Although it was a relatively simple matter to record information in the period up to the time of birth more difficulty was encountered in recording what happened during the neo-natal period. When a baby was admitted to the paediatric department it was usually seen as an emergency and often a failure of communication between the labour record and the paediatric chart was revealed. Details about the baby's name, gestation length, pregnancy complications, etc., frequently did not match up and this was particularly so when the baby had been transferred from home or from another hospital.

There was in most cases not enough information for retrospective analysis and it would clearly be of great value to have a certain amount of information coded by the clinicians at the time of writing the discharge summary. How much data should be recorded obviously had to be decided but Dr McIlwaine suggested that it would be of much greater value to have

a little information about all births rather than a lot about a few. If large categories could be recorded then individuals interested in certain problems could study these cases in greater detail.

DR C H M WALKER, Consultant Paediatrician, Dundee, said that a growing awareness amongst obstetricians and paediatricians in Scotland of the need for a more detailed and accurate documentation of the events of pregnancy and delivery in an attempt to identify further the aetiological factors related to perinatal mortality and those factors related to handicap in childhood had led to a representative group of paediatricians devising for trial early in 1972 an independent baby record which was complementary to the maternal one.

Much of the knowledge now possessed regarding the aetiology of handicap and congenital abnormality had been obtained by the hindsight study of pregnancy and neo-natal data but progress had been impeded for lack of detail and of the ready availability of information that might well have been documented. For this reason the group's primary objectives were considered to be:-

1 basic data capture - accurate, consistent and standardised

2 one document for both the clinical case sheet and for transmission to the computer centre for processing

3 maternal linkage with feedback and

4 that from this document the information required by the Department could readily be extracted in the style of the SMR(1).

Secondary objectives included:-

1 minimal transcription of data

2 minimal writing by medical staff (with at the same time providing enough space for required narrative)

3 maximum entry (the provision of a memory check was felt necessary if items were not to be omitted)

4 avoidance of duplication on the mother's and baby's record

5 minimal decisions by clerical staff and

6 that the document could be used without further clerical time and effort as a discharge letter sent to GPs.

The institution of this record also had the great advantage that for the first time the baby at birth would be regarded as an individual in his own right.

The SMR(N) currently under trial was laid out in two cards, the first into easily identifiable blocks, ie identification, maternal record, labour, births and discharge record with a final diagnosis of four entries coded according to the Cardiff classification. Card 2 was the clinical examination record and identified the various significant features which might be detected in any new born baby. This document was not suitable for babies admitted to special or intensive care units but was intended for the vast majority of normal or near normal new born infants. A further more detailed card (card 3) was being designed for the special care situation.

For various reasons returns could not be wholly completed for the areas selected for the pilot survey and although the return rate from some areas averaged 70% the overall return rate was 43%. Dr Walker then gave some illustrations of the data extracted from the computer print-out and, although the data represented only a small section of that which was available from the trial and had consequently little relevance in terms of national statistics, he considered that they illustrated a few points of interest.

The usual data such as sex ratio, male:female 1.1:1; mortality, 5 per 1000 live births; birth weights below 2,500g, 6.7%; had relevance in respect to national returns and could identify areas where the deployment of resources might need further thought. Such items as 26% of babies not having had Guthrie tests performed before discharge indicated the level of awareness required of the follow-up services. Items such as 1.5% children discharged from the maternity service to various forms of child care gave an indication of the social service facilities that might be required in an area and it might be interesting to look more closely at the reason why 3.8% of babies were transferred to other hospitals before final discharge.

Further examples related to discrepancies in respect to the incidence of infants stated to be born prior to the end of the 37th week of gestation and the number who were assessed clinically to be of this gestational age, ranges in prematurity, incidence of Apgar and ranges in the discharge patterns between hospitals.

On studying the figures it became clear that nomenclature of diagnosis varied from place to place and this illustrated the fact that it was necessary for clinicians to come to some agreement as to what was meant by each diagnostic category. For instance, it was necessary to decide on the limits of physiological range and what was regarded as pathological and whether or not minor items such as clicking hip, minor sepsis and transient skin lesions should be documented if they had disappeared by the time of discharge. Another interesting discrepancy lay in the incidence of post-maturity in the diagnostic coding.

Clearly the searching for a number appropriate to the written word diagnosis took some time but for the normal baby it had been found that a relatively small number of diagnostic categories was required.

In 1973, some 20,000 phase 2 records had been distributed for use in Edinburgh, Dunfermline, Bangour, Perth, Dundee and Inverness. In the Eastern region the SMR(M) and the infant SMR(N) were to be linked. The ninth revision of the ICD was likely to provide answers to many of the problems of coding diagnosis revealed in the trial and there was being prepared a new perinatal supplement to the Cardiff code. Also in Dundee a computer link with general practice records and a link with the local authority developmental screening clinics had been started.

In conclusion Dr Walker noted that this system of data collection was one way in which perinatal data could be gathered on a national scale and the experience to date suggested that it could work successfully. There were organisational problems in some areas but a considerable amount had been achieved towards the objectives. Some extra effort was required but once the "teething troubles" were over the amount of the extra effort was probably less than had been anticipated. The information was worth collecting, worth the effort to achieve it and only when a few years data became available for study would it be possible to consider what could safely be discarded and how further the system might be modified.

DR F COCKBURN, Senior Lecturer, Department of Child Life and Health, University of Edinburgh, commented on his experience to date in the use of SMR(N) in the labour ward and nursery of the Simpson Memorial Maternity Pavilion.

He said that notes could be generated in four ways (1) with the mother's anti-natal record; (2) on admission of the mother to the labour ward; (3) in the post-natal wards of Special Care Unit; and (4) they might be raised by a records officer after discharge. Various advantages and disadvantages accrued from raising notes in the different situations but it was considered that probably the best place was on admission of the mother to the labour ward. The labour and birth record could be completed after delivery of the infant and before his transfer to the post-natal ward. In this way accuracy was increased if the people involved in management of labour and delivery completed the record and if the paediatricians were involved they could complete immediately any active procedures performed on the infant in the labour ward. On the other hand the work load in the labour ward was already extremely heavy and this additional clerical work would require an increase in staff. The changing pattern of delivery in that infants were normally delivered between the hours of 9 am and 5 pm might ease the situation.

The second card (card 2) was normally completed in hospital by the resident paediatric or obstetric staff and if the residents conscientiously completed the form and used the check list to full advantage the system worked extremely well. From the present form it was hoped to obtain a permanent case record and a computerised record of unit activities from which information should be available over a long period and also on a month to month basis.

To date the Cardiff classification had been used and in many ways it had proved inadequate to the task, and very careful consideration of the application of these classification numbers to this form of code sheet had to be given before recommendations were made for its application on a nation-wide basis. Many of the difficulties encountered were also caused by frequent changes in staff and careful supervision and training was required at regular intervals.

There were two major drawbacks to the value of SMR(N) as a case record. The first was that temperature and weight charts were not at present an integral part of the record and secondly the poor quality of the duplicate copy as a permanent case record. Although it might eventually be possible for a paediatrician in a children's hospital to obtain the neo-natal records from a central computer, until that time a good permanent record had to be retained within the maternity hospital or neo-natal intensive care unit. Neo-natal records had evolved in most hospitals as an appendage of the maternal case record and in some units there was still no separate record of the infant. Since paediatricians became involved in the care of infants within maternity hospitals they too had tended to produce their own records. It should be emphasised that there were almost as many infant case records as mothers and that as morbidity and mortality were very much higher in the infants than in their mothers so neo-natal records were just as important. If the neo-natal and its linked maternal record were to be considered the primary medical record of an individual then it was important that the information obtained was accurate and easily retrievable. Records officers or other clerical staff must be made available if this aim was to be achieved.

In conclusion Dr Cockburn noted that a unified system of neo-natal recording was almost within reach and there should be little difficulty in achieving a satisfactory case record and effective computer retrieval of information from the one document.

MR J H SCOTT, Computer Manager, Eastern Regional Hospital Board, discussed the computer processing of the pilot scheme in relation to neo-natal discharge records. The equipment used was an ICL 1901A processor with punch card input.

Validity checks only, ie checking that the data fell within acceptable range limits, were carried out in the pilot scheme since (i) it was desirable that programming was kept to a minimum (ii) the main object of the pilot scheme was to examine what data should be collected and how it should be collected rather than ensuring that the data accepted was completely error free and (iii) the programmes were required to be produced in a short space of time.

The main errors found in the processing related to 'information missing', which was frequently caused by fields being left blank instead of 'not known' codes being used and 'information completed - but outwith range' occurring less frequently and usually the result of a wrong figure being entered. The error rate was initially 10-15% but this dropped considerably after the common errors had been eliminated.

The other main problems which came to light during the pilot scheme were:-

a the computer programme treated each of the two punched cards containing the record individually and therefore, when one card was rejected because of an error and the other was accepted, only half of the record was in the computer file. This made the error difficult as it was than necessary to re-input only the half which had been rejected;

b there was no control on which records had been accepted. Thus it was possible to omit records completely or to input them twice; and

c the standard of writing on many of the records left much to be desired.

Approximately 70 tables were produced from the data received: these would form the basis of regular standard tabulations. In addition it was possible to produce ad hoc tabulations using either the normal data or data recorded in the local option section of the record.

Based on the result and experience of the pilot scheme a number of improvements had been introduced for the 1973 trial. These included:-

a 'Not Known' codes for almost every field although it was hoped that these would be used as infrequently as possible

b range limits had been amended where these proved to be inadequate

c clearer instructions on the completion of the record had been printed on the reverse

d both punched cards relating to a record must pass all checks before either was accepted

e monthly lists of accepted records would be produced and it would be possible therefore for hospitals to control the records

f the record had been re-designed to facilitate completion, and larger boxes had been provided in the hope that this would lead to improved legibility.

In relation to the output tabulations to be incorporated in the tables produced from the 1973 data, improvements would provide for headings being in English rather than codes and Cardiff classification descriptions being used instead of International Classification descriptions. In addition it was hoped to link the SMR(M) data to the Neo-natal record using the Maternal Case Reference Numbers.

Apart from any further improvements which might become evident from the 1973 trial, it was expected that a full range of feasibility checks would be incorporated into the system in due course. At present certain items of data were collected on both the SMR(N) and the SMR(M) and it was hoped that successful linking of these records would lead to the elimination of this duplication.

DISCUSSION

In opening the discussion DR I D G RICHARDS, Director, Social Paediatric and Obstetric Research Unit, Glasgow, emphasised the importance of collecting neo-natal statistics on a national basis. By establishing a national service, data provided by different areas and hospitals could be compared which would be of value in health service planning. The quality of medical care might also benefit by making available comparative information between units for instance by highlighting the fact that perinatal mortality rates varied from 4 to 54 per 1,000 in different hospitals. The information might also serve as a starting point for epidemiological studies such as in relation to the causation of congenital malformations and epidemics of malformation. Data would also be of value for use in relation to clinical care and here it was essential that the information should be made available to all those involved in health care who would have a use for it.

In the establishment of an information service of this type Dr Richards emphasised that it was important to ensure that (i) the collection of data was purposeful, (ii) the information to be collected was of a type which could be recorded accurately and completely and (iii) the data could be collected during the routine care of the infant and not as an exception.

While welcoming the introduction of the service on a national basis, he indicated that it might be worthwhile taking a critical look at SMR(N) with a view to reducing the total amount of information which it was proposed to collect for each patient on an all Scottish basis.

In the course of the discussion session the following were the main points to emerge:-

1 Use of data

Although the Scottish hospital data system was generally accepted as one of the most sophisticated in being, it was appreciated that much remained to be done to ensure that the optimum use was made of the information made available. It was necessary to consider how to develop the best partnership between the various skills and professions involved and also to establish a relationship in which

responsibility for the use of the information was shared. In the re-organisation of the NHS, information services would be locally based and it was anticipated that the community physician would assume an important role in assessing data at local level. It was therefore most important that local records systems were geared to cope with anticipated developments in the information services which would be established under re-organisation.

2 Feedback

It was considered that, although it was most important to collect data relating to neo-natal care on a national basis, the method and type of feedback of information had to be carefully considered. Data prepared from incorrect returns clearly was valueless and served to bring any information system into disrepute. It was therefore desirable that every effort should be made to achieve a high level of accuracy in the completion of returns and also provide for a 'vetting situation' in respect of the data prior to publication. Much information would be collected and available for distribution but for it to have practical effect in terms of the treatment and care of patients, it was essential to include some explanation and comment on the data issued. In seeking improvement in the level of patient care by producing information on a national and comparative basis a long process of interaction between those concerned would be involved, and in the present initial stages of this scheme it was important to put over the value of the exercise in an effective way and to this end presentation and accuracy of data were most important. A lack of interest in statistical material particularly amongst junior staff was not uncommon and the role of the senior doctor as an educator in this respect was stressed.

3 Completion of returns

Different views were expressed as to the most appropriate person to complete the statistical returns so as to ensure a high level of accuracy. For SMR(1) and SMR(M) it was felt that, in general, with good hospital clinical records the forms could best be completed by clerical staff without encroaching on the doctor's time. In this connection the ward clerkess could be most useful in completing forms. In the case of SMR(N), however, which called for more clinical details and was designed to be used as a case record, the intention was that the return should be completed by the doctor. It was considered by some however that this was not the proper use of a consultant's time and completion should be the responsibility of records departments which in cases of doubt should have easy recourse to clinicians for clarification. To ease the situation in these departments which often had a high turnover of staff, the semi-structured discharge letter could be useful.

4 Record linkage

It was suggested that, particularly in units with a high level of rooming-in, the duplication of information on SMR(N) and SMR(M) in relation to the mother was unnecessary. In terms of computer input however it was proposed to link certain data from the two forms and the basic information on the mother which was recorded on SMR(N) was intended for use in baby care at the bedside in the situation where the mother was not present.

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